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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

THE MARL AND LIMESTONE OF THE BORDERS OF THE NEUSE AND TRENT.

To the Editor of the Farmers' Register.

Egypt, Craven county, N. C.
March 24, 1840.

It was a matter of regret to us that you were unable to visit our section of the state, [in November,] whilst on your "jotting" expedition; but we are much consoled by the reflection that you have not abandoned your intention of so doing. Your trip might be made more interesting to you, to say nothing of the additional facilities and comforts the route would afford you, by taking the Wilmington rail-road to Waynesborough, on the Neuse river. In the vicinity of Waynesborough, you might be gratified by visiting and viewing the limestone formations of the Sarponey hills, which are thus described by Professor Olmsted, in his Geological Report:

"In the eastern part of the county of Wayne is a high ridge of land, extending along the south side of the river, (Neuse,) for several miles, and dividing the waters of this river from those which pursue a longer course to the Cape Fear. These hills are covered with large blocks of a fine stone marl, beneath which, at the bed of the river, lies a formation of limestone, of the description called by mineralogists *oolitic limestone*—different in its appearance from all the other beds which occur on this river. The most favorable view of these rocks occurs at Mr. Griswold's, on the bank of the river, nine miles below Waynesborough, where a bluff, ninety feet high, exposes them fully to inspection. Thirty-five feet above the limestone, in the side of the hill, the blocks of marl above mentioned made their appearance. It is of a close texture, nearly or quite destitute of shells and other organic remains, and does not, like the stone marl further down, fall to pieces on exposure to the weather. It is of a lively gray color, and when first removed from the bed it is so soft as to be easily cut with a knife, or sawed into blocks; but on becoming quite dry it grows hard and firm, and assumes every appearance of a most elegant building stone. Indeed, on comparing it with a specimen of the celebrated Bath stone (which is used for the finest public buildings of the city of London) recently taken from Westminster Abbey by the Rev. Dr. Caldwell, (the late lamented president of the University of North Carolina,) the eye can hardly discern any difference between them, but the two appear equally well fitted in texture, color and beauty, for the finest purposes of architecture. It is composed of sixty per cent. of lime and forty of a fine gray clay. It is therefore a true marl." This country abounds in all the *materiel*, for becoming a rich agricultural section, although the lands naturally are not rich, and possesses likewise the great desideratum of being healthy. As you progress lower down the Neuse, seven miles below Waynesborough, *by land*, you encounter the beginning of a most extensive and singular deposite of copperas, which extends along the Neuse for more than one hundred miles—these formations are so very extensive on the banks of the Neuse river, that if necessity should ever compel our citizens to the manufacture of this article, here are deposites sufficient not only for home consumption, but for very great exportation. You will find all along the banks of the river evidences of limestone formations until you reach the plantation lately owned by Isaac Croom, esq., in Lenoir county, where there are some very rich and valuable deposites of marl. These beds are of extensive formation and have been sold at one hundred and twenty-five dollars per acre, a sum far below their value, to their present owners, if they are ever applied to their lands—they lie immediately on the banks of the river, are of easy access, and the marl can be boated at little expense. Mr. John C. Washington, of Vernon, near Kinston, in Lenoir county, has purchased an acre of this formation, and intends to transport marl down the river in boats some six or seven miles, and then haul it in carts to his farm. You will recollect that specimens of this marl were submitted to your inspection and analysis, and that the lower bed contains $\frac{48}{100}$ of carbonate of lime, and the upper one $\frac{75}{100}$. Descending the river about twenty-five miles, you will meet with a most extensive and interesting formation of marl at Fort Barnwell, the residence of Col. Samuel S. Biddle; in fact, all of his lands lying along the river are more or less impregnated with lime, and it is a singular fact, that whilst the lands of nearly all of the old settlements in this section of the country, are almost worn out and perfectly impoverished, these limestone lands still retain their heart and strength. Col. Biddle has made but limited applications of marl to his lands, but is turning his attention to this interesting subject, and I trust ere long will give you the results of his experience and observation. Adjoining the farm of Col. Biddle is my own. I have lately, in my largest field, opened a pit of marl, which has all the appearances of being extremely rich, and of almost boundless extent. The formation consists of a vast collection of scallops, oysters, conchs, corals and madrepores, all blended together in minute particles, except now and then you may obtain specimens of entire shells of each description. I have sent to our university some very interesting specimens of shelly and organic remains taken from this pit, and hope thereby to elicit much valuable information in relation to them and their *genealogy*. From several indications about this pit, I have been induced to believe, that with the proper apparatus for boring, I could soon obtain salt water, which, if it yielded a brine of half the strength of the New York salt wells, would be of great value. The well at Liverpool in New York, is eighty-two feet deep, (only,) and contains the strongest brine in the state, as 40.5 gallons yield a bushel of salt. Dr. Beck has given the strata found in digging this well: "Shell marl twelve feet, fine sand fourteen feet, very fine grayish clay forty-three feet, below this, a deep bed of gravel, in which the brine began to appear, and soon rose to near the surface."

I have not excavated to the extent here spoken of by Dr. Beck, but as far as I have progressed, the indicia seem to be the same as indicated in his report. And why should there not be salt water found? We are not more than fifty miles in a direct line from the ocean, this "low country" has almost a uniform level from the sea, with no great elevation above its high tides, and the deposites here found, are all of a marine character. But I will not pursue this inquiry further, until I have made some further investigations, which I contemplate making. Upon leaving Egypt, on your way to Newbern, you will find, every now and then, on the river, appearances of lime and marl, until you reach the plantation of Isaac Taylor, esq., about three miles from Newbern. Mr. Taylor is one of our best practical farmers, and has turned these limestone formations on his lands to good account, as is best evidenced both by the appearance of his crops and quantity of corn and cotton produced from them. His plantation, however, possesses advantages which but few others enjoy. In front of his farm, on the river, there are extensive flats or marshes, which produce an inexhaustible supply of coarse grass, which is here used for hay, being cut and cured as the other grasses which are converted into hay. Our horses and cattle are very fond of it, and large quantities are cut and sold in the town of Newbern for winter forage from the marshes, in the vicinity of the town. This, with the lime, affords an abundance of manure, particularly when taken from the stables, &c., after it has been pulled to pieces and trodden down by the stock. Four miles and a half from Newbern, at Johnson's Point on the Neuse, about five feet above low water mark, these beds of shell marl again make their appearance. Here is an inexhaustible quantity of marl, lying in its native beds perfectly undisturbed, and for all practical purposes utterly useless, although the access to it is as easy as nature could make it. The lands too on Brice's creek, and the surrounding country, would be prodigiously benefited by an application of this marl, being entirely made up as it is of marine substances, among which are scallops, oysters, clams, conchs, corals and madrepores. The expense of excavation and removal from this place to the farms in the vicinity could not be very great, as the water facilities are as good as they could be desired. Ascending the Trent river, one of the prettiest stseams in our country, you pass through a district of land which affords some of the finest farms in our state; about three miles from Newbern, you will come to the farm of George Wilson, esq., one of our most scientific farmers. Mr. W. has contributed largely to our agricultural knowledge, and is an able contributor to many of our best agricultural periodicals. Here you will find an abundance of limestone yielding a very large per cent. of carbonate of lime. Mr. W. converted this stone into lime by burning it in furnaces, and has sold much of it in market. The beautiful episcopal church in Newbern is built with lime from Mr. Wilson's furnaces. The Trent river is very rich in limestone formations, nearly all the way up, and at Mr. Hargeth's, three or four miles above the farm of Mr. Wilson, you will obtain a full view of the limestone where the rock has been quarried for use. As this singular and abundant formation will, no doubt, in time to come, constitute the gold mines of this section of the country, I will give you Professor Olmsted's description of it, as received and examined by him. "It makes its appearance on the left bank of the river near its bed, and fifteen feet below the surface of the ground. It has been traced a mile up and down the river, and extends to an unknown depth, lying in horizontal masses. This limestone consists almost entirely of small convex concretions, irregularly aggregated, and forming numerous cavities. The peculiar forms of these concretions make them resemble the moulds of shells, no longer preserving their organic character, but now united with silex into a rock. The cavities contain more or less water which holds a portion of the lime suspended, so that there exudes from the rock when first removed from its bed, a liquid resembling milk. The color of the stone, when first quarried, is a bluish green, and its hardness is not much greater than that of ordinary limestone; but on exposure to the air, it becomes brown, and hard enough to fire with steel. It is in fact a natural mortar, composed of about three parts lime and one sand, with a little iron. To its union with this sand, and to its entire freedom from clay, is to be ascribed its property of acquiring such remarkable hardness. The principal use of this limestone at present, is for mill-stones, particularly such as are wrought by hand, or hand mill-stones, which are in common use in the neighboring country. A pair of these is furnished at three dollars. The large kind, or water mill-stones, bring forty or fifty dollars." Six or seven miles further, upon Mill Creek, a tributary of the Trent, is found the most singular deposite of oyster shells that occurs in any part of the world; they are really of the mammoth genus, and are found in extensive beds. Professor Olmsted saw and obtained many of these shells measuring a foot and more in length, and of correspondent width. Many of these shells, upon being exposed to the air, crumble and decompose, and form a rich deposite of lime. J. Collinson Burgwyn, Esq., of Green Hill, in Jones county, whose farm lies upon the Trent and this creek, in the course of the last year caused quantities of these shells, which are found also in great abundance on the river, to be dug up and spread on his fields, the worth of which he will ascertain from his coming crop. It is to be hoped from Mr. Burgwyn's known devotion to the science of agriculture, that a fair experiment will now be made, in testing the value of these organic remains, and that we shall be favored with the practical results of his experiment. A little farther up, another singular formation of shell marl occurs on the plantation of Joseph Whitty, Esq., differing in its location from other similar deposites, as here it breaks out "on the borders of one of those remarkable swamps called *pocosons*." I do not know that Mr. Whitty has made any use of this rich deposite on his land, for in fact although this section of country affords such inexhaustible resources of this kind, but few of our planters have yet obtained their own consent to abandon even in a measure the old fashioned way of manuring, and to try an experiment on a small scale. It was on this plantation whilst it belonged to Durant Hatch, sen., that a most interesting discovery was made in digging a well, which is well authenticated, and which we have often heard Gen. Hatch speak of

in his lifetime. After the diggers had progressed between fifteen and twenty feet into the earth, they came to the head of an Indian cypress canoe, which had been tied to a cypress knee with a rope—the rope when exposed to the air, crumbled and fell down into a fine pulverized substance like ashes. Gen. Hatch had the head of the canoe cut off and kept it many years as a curiosity. As Buffon seems to think that this continent was formed by the rotatory motion given to the sands, &c., by the ocean around some mountain, &c., and was gradually enlarged, &c., here is a well established fact, which would give employment to some antiquary for years, particularly when connected with the marine and organic remains which surround it. At Mr. Becton's, in the northwestern part of this county, there occurs "a deposite of a hard, dark-colored limestone, containing small oyster shells imbedded together with an abundance of sharks' teeth, sometimes penetrating the rock, and sometimes scattered loosely among the seams." This is a very pure limestone, containing ninety-three per cent. of lime, and extends into Lenoir county, and may be traced to the farm of Col. Blount Coleman, in that county, where it appears in very great abundance. I neglected to mention a formation of stone marl near Mr. Becton's, of the richest kind yet discovered in this country; but as I have, I fear, wearied you with this dull detail of our internal agricultural resources, I will not trouble you with any further descriptions of them. Enough has been said, I trust, to induce you to come among us, for if there be any country that affords a rich and boundless field for investigation, &c., it is ours—and we venture to affirm, that not one can be found where the lavish gifts of nature have been so shamefully neglected and rejected.

Respectfully yours,

JAMES W. BRYAN.

CULTURE OF THE POTATO.

From the Cultivator.

By common consent the potato has been placed at the head of all the edible roots, wherever it has been introduced, and the climate would admit of its cultivation. Originating from an obscure and worthless root among the Cordilleras of South America, in spite of prejudice and opposition, it has spread with a rapidity unknown to any other vegetable, and is doubtless destined to make the circuit of the globe, adding in an incalculable degree to the means of subsistence. There are few if any vegetables grown in the temperate zone that yield so great an amount of food per acre as the potato. Wheat, according to Sir H. Davy, contains 950 parts of nutritious matter in 1000; and the potato 250; but when it is remembered that the yield of the potato on an average is from ten to fifteen times as much per acre as wheat, the advantage in favor of the potato is manifest. Besides such is the human organization that pure nutritive matter is injurious to its healthy functions, and the stomach requires to be more or less distended with other matter before the excitement necessary to nutrition takes place. We are, therefore, justified in supposing that good potatoes used exclusively as an article of food, would be less injurious than pure wheat flour. Be this as it may, the potato in most civilized countries now ranks next as an article of food to the rice of the tropics; and the wheat and maize of the more temperate regions. To Europe is America indebted for the graminæ, and had we returned them nothing more than the potato and maize, the debt must have been considered as cancelled.

The potato is usually propagated by the tubers or roots, but new varieties are obtained or old ones that have partially degenerated restored, by cultivating them from seed. There are few plants that show more decisively the improvement that may be made by cultivation than the potato. In 1838, a quantity of the original roots were brought from South America to England, and carefully planted. The result was a small inferior root, more resembling the ground nut than the potato, and not widely differing in appearance from those of the first year's growth from seeds. There is an idea prevalent among many farmers that potatoes are mixed, or what by the breeder of animals would be called crossed, by having several kinds planted in the vicinity of each other. This is an erroneous opinion. The crossing takes place in the flowers or seeds and not in the roots; and hence there is the same uncertainty that the seeds of any given variety of this root will produce potatoes of the parent kind, that there is that the apple seeds will give apples like those from which they are taken, a thing of very rare occurrence.

Every farmer who has paid attention to the manner of growth in the potato is aware that the tubers are not produced from the roots proper, these being, as in other plants, used solely for the purpose of nutrition, but on shoots thrown out above these, and nearer the surface of the earth. It was the opinion of Decandolle that by repeated coverings of the stem such shoots, and of course potatoes could be produced the whole length of the stalk, and some experiments that he made seemed to favor such a supposition; still we must be permitted to say, that having in part repeated his experiments, we have found nothing to justify the opinion that such a result would be effected by this treatment of the stem.

The propriety of cutting the tubers or planting them whole has been much discussed, and the multitude of experiments on record would seem to show by their conflicting results, that at least as much is depending on other circumstances, as on the root being planted in a whole or cut state. If an acre of ground be planted in hills or drills with whole potatoes, and another acre be planted with sets or cuttings at equal distances with the other, the experiments made by the London Horticultural Society would go to prove that the acre planted with whole potatoes would yield the most, but not much if any more than the additional quantity of seed required in planting. If whole potatoes are used, from twenty-five to thirty bushels will be used; if cut, not more than half that quantity will be required. In both cases, however, much will be depending on the size of the whole potatoes, and the number of eyes in those cut. The distance between the rows must be determined by the length of stem produced by the potato, and the several varieties vary much in this respect.

In cultivating the potato a climate rather cool

and moist is found most preferable to any other. Of course the root succeeds much better in the northern states and in the adjoining British provinces than in the southern parts of our country. In the north, parts of Maine and New-Hampshire, and the Province of New-Brunswick are celebrated for the excellence of their potatoes. In New-York, the tract lying east of Lake Ontario, between that and the Mohawk and Black rivers, produces good potatoes; and the elevated lands in the south of New-York and the north of Pennsylvania are noted not only for the quality of their potatoes but the large crops they annually produce. The potato will succeed well on almost any kind of land provided it is rich, and is not wet and clayey; but for this, as for most other crops a friable loam of sufficient consistence to prevent drought will be found superior to any other. Swamps containing large quantities of vegetable matter, when sufficiently drained, have produced great crops, and what in new countries is termed muck land, is also favorable to their growth. Two things in a potato soil seem to be indispensable; it must be rich, or a crop cannot be expected; and it must be sufficiently loose to allow the shoots that form the tubers to spread and enlarge freely. In Europe the British islands are justly famed for their root culture, and the introduction of the potato into Ireland has enabled that country to double its population; if it has not banished want and distress, these evils are not of as frequent recurrence now as formerly, notwithstanding the increase of consumers. Cobbett, indeed, charged upon the potato all the evils of Ireland; and Dr. Tissot has demonstrated to his own satisfaction, that no potato-eating nation has ever produced a great man.

The greatest crops of potatoes on record are those grown by General Barnum of Vermont, which reached from 1,500 to 1,800 bushels per acre; and he gives it as his opinion, that in a good soil, and with his mode of culture, from 800 to 1000 bushels per acre may be safely calculated upon. The reports of the agricultural societies of our country show that from 500 to 700 bushels per acre are not uncommon. Mr. Bache, of Wellsborough, Pa. in 1839, raised 600 bushels to the acre, and the crop of Mr. Morris, of Cattaraugus, in this state, fell but little short. The average crop in the country cannot we think be estimated at more than from 175 to 250 bushels, the influence of the seasons being more felt on this crop than many others.

The methods of planting are various. Gen. Barnum's mode, after a careful and thorough preparation of his land, is to plant in drills 22 inches apart, and the sets in the drills 10 inches from each other. The drills are kept clean, but the earth is hilled around the plants only once in the season; as he considers there is much danger of disturbing the young tubers by removing the earth or causing the formation of new shoots for tubers by repeated hoeings or hillings. The secret of his great crops appears to consist in his bringing rich fresh earths, the scraping of the ditches or streets, or earth from the barn-yard, or the mould deposited in swamps, and giving each hill a shovel full, as a top dressing. He does this with the aid of a horse and cart, the horse and the wheels passing between the rows.

We have seen very good potatoes grown by simply dropping the seed on a clean turf, and spreading over them a covering of straw six or eight inches in thickness. The straw must be evenly placed, and if moved by the wind before it gets settled together, which it will soon do, it must be carefully replaced. This covering of straw keeps the surface moist, the grass can not spring up through it, and in the fall the potatoes are found on the surface of the turf, and perfectly clean when the straw is removed. The danger in this mode of planting would seem to lie in a dry season which is frequently fatal to the crop; and a *heavy* crop is rarely in this way produced.

In the Monthly Visitor, for February, 1840, is an account of an experiment with potatoes, which was eminently successful, and deserving of notice. In the spring of 1839, Mr. Whitney of Crafisbury Vt. "broke up a piece of green sward, harrowed it thoroughly, carted upon it manure from the yard at the rate of 32 loads to the acre, cross ploughed it, harrowed it again, and planted it in the usual manner in hills. At the proper ploughing between the rows, the piece was well hoed, and at the proper time was repeated. In the fall he dug from this piece at the rate of 300 bushels to the acre, which for this year, on account of the rust, was considered a good yield. By the side of this piece, on precisely the same quality of soil, manure was carted and spread at the rate of 32 loads to the acre; the sward was then carefully turned over, and the furrows laid flat with a roller. Between every other furrow, where they came together, (that is between the first and second, and between the third and fourth and so on,) holes two feet apart were made with a sharpened stick, about three inches deep, large enough to receive the seed. Into each hole one piece of potato was put, and the holes filled up with mellow soil, even with the general surface of the field. There was no further labor bestowed upon the crop till the digging, when the quantity produced was a little over 400 bushels per acre. Although never hoed not a weed was seen in it. Before digging, the field had the appearance of having been well hoed, the potatoes having raised up the ground above them."

The Rohan potato is an instance of the fortunate production of a new and valuable variety from seeds. This root which, wherever it has been tried in our country, seems to have satisfied all reasonable expectations that had been formed, is destined doubtless to add much to the value of the potato crop: and no good reason can be given why other, and still more productive kinds may not be produced by the same methods. A comparison of a crop of Rohans with one of the original wild potato, would seem to justify expectations of still further improvement, from the combined agencies of cultivation and reproduction from the true seeds.

In all cases the value of early potatoes is great; and particularly so in the vicinity of cities, where a constant demand, and ready market for such vegetables always exists. Experience has taught the growers of potatoes for the London market that ripe potatoes can be found from ten to fourteen days earlier in hills or drills planted with sets from the top end (the one that has the most eyes) than in those planted from the root end of the tuber, The Lancashire gardeners therefore assort their sets, so as to have them ripen at the same time,

and thus obtain roots for market sooner than they otherwise could do. It is probable that quite an improvement might in this country be effected in the same way.

DIONÆA MUSCIPULA.

From "Curtis' Enumeration of Plants around Wilmington, North Carolina."

This plant is found as far north as Newbern, N. C. and from the mouth of Cape Fear river nearly to Fayettevilie. Elliot says, on the authority of Gen. Pinckney, that it grows along the lower branches of the Santee in S. Carolina. Dr. Bachman has received it from Georgetown, S. C.; and Mr. Audubon informed me, with the plant before us, that he has seen it in Florida of enormous size. I think it not improbable, therefore, that it inhabits the savannas, more or less abundantly, from the latter place to Newbern. It is found in great abundance for many miles around Wilmington, in every direction. I venture a short notice of this interesting plant, as I am not aware that any popular description of it has been published in this country.

The leaf, which is the only curious part, springs from the root, spreading upon the ground, or at a little elevation above it. It is composed of a setiole or stem with broad margins, like the leaf of the orange tree, two to four inches long, which at the end suddenly expands into a thick and somewhat rigid leaf, the two sides of which are semicircular, about two thirds of an inch across, and fringed around their edges with somewhat rigid ciliæ or long hairs like eyelashes. It is very aptly compared to two upper eyelids joined at their bases. Each side of the leaf is a little concave on the inner side, where are placed three delicate, hairlike organs, in such an order, that an insect can hardly traverse it, without interfering with one of them, when the two sides suddenly collapse and enclose the prey with a force surpassing an insect's efforts to escape. The fringe or hairs of the opposite sides of the leaf interlace, like the fingers of the two hands clasped together. The sensitiveness resides only in these hairlike processes on the inside, as the leaf may be touched or pressed in any other part, without sensible effects. The little prisoner is not crushed and suddenly destroyed, as is sometimes supposed, for I have liberated captive flies and spiders, which sped away as fast as fear or joy could hasten them. At other times I have found them enveloped in a fluid of a mucilaginous consistence, which seems to act as a solvent, the insects being more or less consumed in it. This circumstance has suggested the possibility of their being made subservient to the nourishment of the plant through an apparatus of absorbent vessels in the leaves. But as I have not examined sufficiently to pronounce on the universality of this result, it will require further observation and experiment on the spot, to ascertain its nature and importance. It is not to be supposed, however, that such food is necessary to the existence of the plant, but like compost, may increase its growth and vigor. But however obscure and uncertain may be the final purpose of such a singular organization, if it were a problem to construct a plant with reference to entrapping insects, I cannot conceive of a form and organization better adapted to secure that end than are found in the dionæa muscipula. I therefore deem it no credulous inference, that its leaves are constructed for that specific object, whether insects subserve the purpose of nourishment to the plant or not. It is no objection to this view that they are subject to blind accident, and sometimes close upon straws as well as insects. It would be a curious vegetable indeed, that had a faculty of distinguishing bodies, and recoiled at the touch of one, while it quietly submitted to violence from another. Such capricious sensitiveness is not a property of the vegetable kingdom. The spider's net is spread to ensnare flies, yet it catches whatever falls upon it; and the ant lion is roused from his hiding place by the fall of a pebble; so much are insects, also, subject to the blindness of accident. Therefore the web of the one, and the pitfall of the other, are not designed to catch insects! Nor is it in point to refer to other plants of entirely different structure and habit which sometimes entangle and imprison insects. As well might we reason against a spider's web, because a fly is drowned in a honey pot; or against a steel trap because some poor animal has lost its life in a cider barrel.

DURHAMS VS. DEVONSHIRES.

From the Cultivator.

Messrs. Editors—Permit a subscriber to make a remark or two on an article in your December number, recommending Devonshire cattle in preference to the Durham. I would first observe that the recommendation comes under no responsible signature; the assumed one of "*Phelim*," is no guaranty for the good faith, disinterestedness or soundness of the advice, and in a matter of such importance, the incurring the vast expense of changing one high priced breed for another, we should at least know in whose judgment and experience we are asked to confide. In general it would heighten the character of your publication, if all your correspondents were required to give their names with their communications, but more especially where facts are stated or advice volunteered.

Phelim informs us, that among northern farmers, the Durham cattle are considered "not adapted to the climate, the pasture not sweet or rich enough, and the winters too cold or severe." He then asks "whether it would not be a good plan to buy some other breed that will keep on short pasture and stand our severe winters?" Admitting his premises, the answer to this inquiry would undoubtedly be in the affirmative; but it seems to me that in pitching upon the Devonshires as a substitute, he could not have made a worse choice among all the known breeds of improved cattle. I will admit that the latter being a lighter breed may exist on shorter commons, but why does he expect them to possess more hardiness than the Durhams? Is it because his favorites derive their origin from the mild relaxing climate of Devonshire, where myrtles and oranges endure, almost without protection, what can hardly be called a winter, while their rivals from their birth are accustomed in their native county, Durham, to face the blasts of the frozen North Sea, or has any

legerdemain (we know the arts of cattle breeders are wonderful,) transformed the delicate constitution of the Devons into something like that of the Arctic bear?

In other respects Phelim has not given an exaggerated description of this celebrated stock, but I must have better evidence than unsupported assertion before I can believe that they excel the Durhams in ruggedness of constitution. In our *southern* states, tho Devons would probably find a congenial climate, while the improved Durhams, mingling the blood of the Flemish and native British races, have all the predisposition that descent can give to make them hardy, and to fit them for our own rigorous seasons. In evidence of this, we see them extending themselves even into the Scottish territory, whilst the other (Devons) are never attempted. If a change becomes necessary, would it not be better to take them from a more northern than a more southern district. With this view, I do not *recommend*, but I venture to direct public attention to the far-famed Ayrshire breed, as possessing all the qualities Phelim presumes the Devons to possess, except, perhaps, their peculiar fitness for the draught, while they are altogether superior as a dairy stock. I do not surrender the Durhams, however, where they are not stinted in their summer pasturage or starved during winter upon straw, and the following instance will show that they rank high as draught cattle; a pair of Durham steers raised by the late Mr. Brentnall of Goshen, have in one day gone from that village to the Landing at Cornwall, a distance of about 20 miles, and returned the same day *with a load!*

One point of conceded superiority the Durhams possess which has not been touched upon; that of early maturity. Phelim confesses that the cows of the Devonshire stock are smaller than the bull; this *is* a disadvantage, and hence their calves, as far as my experience goes, are small, puny and of slow growth, requiring at least one year more than the Durhams before they are fit to breed.

RECEIPT FOR DESTROYING CATERPILLARS, USED BY THE SOCIETY OF CHRISTIANS CALLED SHAKERS, AT CANTERBURY, N. H.

From the New England Farmer.

"Take equal parts of spirits of turpentine and train oil; apply them by means of a swab fixed on a pole, commence the operation in the spring, (we suppose on the first appearance of nests) when these devouring insects begin to appear, and repeat the operation once a week, till the trees are in blow, and very few will escape with their lives." Signed F. W.

The head of the family.

We must express our admiration of this receipt, not because of its novelty, for either of the ingredients would be quite sufficient to kill the insects, as will common soap suds from every Monday's wash, *most thoroughly*, without train oil or spirits of turpentine; but we admire it, as a specimen of the practice and industry of those citizens. If our farmers would only follow *that part* of the receipt, which requires *a weekly attention*, for three successive weeks, it is immaterial whether they use spirits of turpentine or train oil, or soap suds, or the brush proposed by Col. Pickering, the evil would be cured at any rate. The great difficulty is the neglect to do *any thing*, till after the caterpillars have covered the trees with nests. Then the labors of the sluggard commence, and *one* tree, (let this receipt be ever so perfect and powerful) will cost as much time and labor as ten trees would have required three weeks sooner. If our farmers would only adopt *that portion* of the receipt, which requires a weekly attack on this enemy, the evil will soon cease, and in ten years we should scarce see a caterpillar in the country. By this course continually pursued, we have so much reduced the labor, that we have not one fourth part of the number we had three years ago.

APPLES FOR FATTENING GEESE.

From the Maine Farmer.

Being at a friend's house the other day, in Livermore, he observed to us that his usual supply of material for fattening his geese had been cut off, and he was not able to regulate himself with quite so fat roasters as common on that account.

On inquiring into the subject we found that he had been in the habit of feeding his geese with apples; feeding them out whole, and uncooked, and permitting the fowl to despatch them in their own way and manner. He said that he never made any distinction between sweet and sour, and never perceived that the geese did, as they generally devoured the whole, and fattened remarkably fast upon them.

We presume that if the fruit were cooked it would be better, inasmuch as it could be more easily eaten and digested. We have never had any experience in this mode of feeding and fattening fowl, and if others of our readers have we should be pleased to hear of their success.

ROLLING, A PROTECTION FROM FLY.

From the Farmers' Cabinet.

It is said, that the best protection to very young plants against the fly, or insects that destroy them as soon as they appear above ground, is to roll the surface immediately after sowing, so as to make it as smooth as possible. The plants *vegetate quicker and better*, by having the earth brought in close contact with the seed, and the insects are deprived of shelter, by having the clods broken down smooth. Every farmer should have a small, light roller for his garden, and a large, heavy one for his fields, to be used as occasion may require. And if, in addition to rolling turnip ground, the seed be sown four or five times as thick as would be proper to stand for a crop, then there would be an abundance for the fly to feast upon, and enough left to satisfy the farmer—and if the fly should not thin them sufficiently, cut them out with a hoe, or run a harrow through them, to reduce them to proper distances, to favor their growth.

The advantage of compacting the earth to the seed, is exemplified in planting corn. The corn first makes its appearance where the impression of the foot is, and with more vigor than it does where the soil covers it lightly.

From the Edinburgh Encyclopædia.

AGRICULTURE OF FRANCE.

Before the revolution, agriculture in France was nearly in the same state in which it is still in almost every country in continental Europe. About two-fifths of the land susceptible of cultivation, were in what is termed culture and pasturage, and produced on an average, about one-half of what good culture, on the like quantity of the same soil, would have produced.

If France has been in any respect benefited by the revolution—if she can claim any permanent and general good arising from it as a compensation and atonement for the physical and moral evils she has suffered and afflicted—that benefit and good must be looked for in the state of her landed property, and in the condition of her agricultural population.

Before the revolution, the land in France was held by various tenures, almost all of which were decidedly and extremely unfavorable to agriculture. The manor rents of the clergy have been variously estimated. Condorcet, in his Life of Turgot, gives it as his opinion, that the clergy enjoyed near a fifth part of the property of the kingdom. Neckar calculated their revenue at 130,000,000 livres; but it is probable that their manor rents may fairly be estimated to have amounted to about 120,000,000 livres, or 4,800,000*l.* sterling, exclusive of their tithes, which may be rated at about 3,600,000*l.* sterling. The domains of the crown and of the princes of the blood, rented for about 1,200,000*l.* sterling; the feudal and honorary dues paid to the nobility, with *corvées*, militia, &c., amounted at least to 5,000,000*l.* sterling. Besides, the government drew from the produce of agriculture the sum of 8,000,000*l.* sterling. In short, it has been calculated, that, exclusive of the rents of land paid to the lay-proprietors, and of the duties of excise, consumption, and the like, the produce of the soil was charged annually with upwards of 21,000,000*l.* sterling.

But agriculture labored under disadvantages still more discouraging and oppressive, previously to the revolution; to understand and estimate which, it will be proper to consider the different modes of occupying land which then existed, some of which, however, as we shall afterwards see, still remain. In the first place, there were the small properties of the peasants. These were to be found every where to a degree of which we have no conception in England, and which we should not have expected in the midst of the enormous possessions, and the oppressive privileges, of the nobility and the clergy. Even in those provinces where other tenures prevailed, they were to be found; but principally in Languedoc; Quercy, which now forms the department of Lot; the whole district of the Pyrenees, Berne, Gascony, part of Guienne, Alsace, Flanders and Lorraine. The condition of the peasantry, who possessed these small properties, varied much in different parts of the kingdom. In Flanders, Alsace, on the Garonne, and more particularly in Berne, they were in comfortable circumstances, and might rather be called farmers than cottagers; and in Lower Brittany many of them were rich; but this character could by no means be applied to them generally. In fact, the minute division of property had produced the effects which might be expected from it; and poverty and misery were too visible, especially in Lorraine, and the parts of Champagne which are contiguous to it.

The second mode of possessing land, was by a money rent. This, before the revolution, was the general practice in Picardy, Normandy, part of Flanders, Artois, Isle of France, and Pays de Beauce. It also existed in some of the southern districts of France, particularly in Berne, and about Navareens, a town in the department of the Lower Pyrenees. These tenures were also found in other parts of France, scattered among those which were different and predominant; but, upon a moderate estimate, before the revolution, they did not exist in more than a sixth or a seventh of the kingdom.

Feudal tenures were the third mode of occupying land. They abounded most in Brittany, Limosin, Berry, La Manche, &c., but they were scattered in a greater or less degree through the whole kingdom. These feudal tenures were fiefs granted by the seigneurs of the parishes, under a reservation of fines, quit rents, forfeitures, services, &c. As they formed the most oppressive evil under which agriculture labored previously to the revolution, and from which that event must certainly be allowed the merit of having freed it, it may be proper to notice some of them. Even to enumerate the whole of these oppressions would far exceed our limits; and, indeed, the English language does not supply terms by which many of them can be expressed.

Among the more mild and tolerable of these feudal tenures, may be mentioned the obligation the tenant was under, of grinding his corn at the mills of the seigneur only; of pressing his grapes at his press only; of baking his bread in his oven. The peasantry in Brittany were obliged to beat the water in marshy districts, to keep the frogs silent, in order that the lady of the seigneur, during her lying-in, might not be disturbed by their noise. In short, every petty oppression which could render the lives of the peasantry miserable, or interfere with the operations of agriculture, was authorized by these feudal tenures; though it must be confessed, that, before the revolution, some of the seigneurs, convinced of their injustice as well as impolicy, forebore to exact them. Nor were the oppressions of the feudal tenures the only ones to which agriculture was exposed. There were numerous edicts for preserving the game, which prohibited weeding and hoeing, lest the young partridges should be disturbed; steeping seed, lest it should injure the game; manuring with night soil, lest the flavor of the partridges should be injured, by feeding on the corn so produced; mowing hay before a certain time, so late as to spoil many crops; and taking away the stubble, which would deprive the birds of shelter. These were oppressions, to which all the tenants of land, as well as those who held under feudal tenures, and even the proprietors of land, in many cases, were exposed. The latter, indeed, were dreadfully tormented by what were called the *Capitainries*, which, as affecting them in some measure, as the feudal tenures affected the farmers, may be noticed under this head. By this term was to be understood, the paramountship of certain districts, granted by the king to princes of the blood, by which they were put in possession of the property

of all game, even on lands which did not belong to them, and even on *manors* granted long before to individuals; so that by this paramountship all manorial rights were annihilated. The privileges thus conferred, were most grievous and oppressive; for by game was understood, whole droves of wild boars, and herds of deer not confined, but wandering over the whole country, to the destruction of the crops; and if any person presumed to kill them, he was liable to be sent to the galleys. It may easily be conceived, that the minute vexations, as well as the more prominent tyrannies, to which the feudal tenures gave rise, would occasion frequent disputes between the seigneur and his tenants; but the latter preferred submitting to them, rather than appealing to the decision of judges, who were absolutely dependent on the seigneurs.

We may here also notice the *corvées*, as one of the taxes peculiarly oppressive and injurious to agriculture, though not confined to the tenure we are now considering. By the *corvées*, individuals were obliged to mend the roads by their personal labor; hence it is evident that this tax must have fallen exclusively on the poor; or if it was performed by those who kept laborers, it must have deprived them of the means of fully attending to their agricultural operations. This tax was not only impolitic, in so much as it placed the repair of the roads under the care of those who were totally destitute of the little skill requisite for such a task, but it was an easy engine of oppression; for, under the pretence that the work might be done without interruption, those who were liable to the *corvée* had it frequently allotted to them at some leagues from their habitations. Besides these *corvées*, which were an oppression to agriculture over the whole of France, there were the military *corvées*, which fell only on the villages lying in the route of the troops; the inhabitants of which were obliged to leave their occupation, however inconvenient and injurious it might be, and repair the roads along which the soldiers were to travel. Such are a few of the oppressions under which agriculture in France labored, previously to the revolution, arising either from the feudal tenures, or from the more general operation of the laws and measures of government, the privileges of the nobility and clergy, and the usages of the country.

The fourth mode of occupying land, resembled that which is common in Ireland, and which is there complained of as a great grievance, and as the source of much misery and oppression. Men possessed of some property, hired great tracts of land at a money rent, and relet it in small divisions to *metayers*, who paid half the product. This mode of occupying land was most common in La Manche, Berry, Poitou, and Angoumois, but it was also met with in other provinces.

The last tenure was that of the *metayer*. These, who are a species of farmers that gradually succeeded to the slave cultivatory of ancient times, and who, in Latin, are called *coloni partiarii*, have been so long in disuse in England, that there is no English name for them. They may be generally described, as supplying the labor necessary to cultivate the land, while the proprietor furnishes them with the seed, cattle and instruments of husbandry, and, in short the whole stock necessary for cultivating the farm. The common agreement was, that the produce should be equally divided between the proprietor and farmer, after setting aside what was necessary for keeping up the stock, which was restored to the proprietor, when the farmer either quitted, or was turned out of his farm.

Before the revolution, seven-eighths of the lands in France were held under this tenure. It pervaded almost every part of Sologne, Berry, La Manche, Limosin, Anjou, Burgundy, Bourbonnois, Nivernois, Auvergne, &c., and was found in Brittany, Maine, Provence and all of the southern districts. In general, the half of the produce was paid to the proprietor; but in Champagne only a third. There were also other variations; in some parts, the proprietor found half the cattle and seed, and the metayer, the labor and implements, besides paying the taxes; the last, in other districts, were partly paid by the proprietor. In Normandy, a singular species of this tenure prevailed, viz., on the farms which the proprietors kept in their own hands.

It is scarcely necessary to point out the miserable state of agriculture, which must exist in a country where the system of metaying prevails. In the first place, it proves a lamentable deficiency of agricultural capital; and, in the second place, it has a manifest tendency to perpetuate this evil, and to keep the tenant in the lowest state of dependence, misery, and poverty. In some parts of France, the metayers were so poor, and consequently so dependent on their landlords, that they were almost every year obliged to borrow from them their bread, before the harvest came round.

Such were the tenures of land before the revolution. Let us now inquire what effects that event has produced on them, and on the condition of the agricultural class in general.

In the first place, the number of small properties has been considerably increased in all parts of France. The national domains, which consisted of the confiscated estates of the church and emigrant nobility, were exposed to sale during the pecuniary distresses of the revolutionary government. For the accommodation of the lowest order of purchasers, they were divided into small portions, and five years were allowed for completing the payment. In consequence of this indulgence, and of the depreciation of assignats, the poorest classes of the peasantry were enabled to become proprietors, possessing from one to ten acres. They support themselves by cultivating these, and by laboring, at the same time, for the neighboring farmers. The number of small properties has also increased from another cause, since the revolution. Before that event, it seems to have been the law, or at least the invariable custom, in some parts of France, to divide the landed property among all the children. This local law, or custom, was extended, soon after the revolution, to the whole kingdom; so that, by the present law of France, land, on the death of a proprietor, is divided, by the law itself, among his children. The deplorable consequences which must ultimately result from this division and subdivision of little properties, in a country like France, already so fully appropriated, need not be pointed out; they are sufficiently obvious. We content ourselves with stating the fact, as illustrating one mode in which the tenure of landed property has been affected by the revolution.

In the second place, hiring at money rent is much more general since the revolution; and if France continues quiet, and recovers from the injurious consequences of the revolution, it may reasonably be expected that this species of tenure will become more and more prevalent.

In the third place, feudal tenures are done away as well as tithes, game laws, *corvées*, &c. In some parts, however, the tenants, by their covenants with their landlords, are still bound to perform some services, but by the law, they must be entirely of an agricultural description.

In the fourth place, the two other species of tenure, that is, monopoly, where men of property hired great tracts of land at a money-rent, and relet it in small divisions, and the system of metaying, still exist, though not nearly to such an extent, or in such an oppressive and ruinous form, as before the revolution. Indeed, when we consider that these species of tenure were the unavoidable and necessary consequences of indequate agricultural capital, we cannot expect that they should be abolished by the mere operation of law, or by the direct effects of any revolution, however wisely planned and carried into execution. If, however, we find that they gradually die away, which seems to be the case, we may safely and rationally maintain, that the revolution, besides the direct benefits which it has bestowed on agriculture, by the abolition of feudal tenures, and partial and oppressive taxes, has indirectly proved advantageous to this first of all arts, by placing in the hands of those who pursue it more adequate capital.

Such are the benefits which the revolution has conferred on the agriculture of France, and which have manifested themselves, notwithstanding the military despotism, which, after exhausting and weakening her for the purpose of enslaving the continent of Europe, has at length brought down upon her a just retribution for her too ready acquiescence in its schemes. These, however, are only partial and temporary evils; and we may confidently predict, that when they are passed away, the agriculture of France, which, from her excellent climate and easily worked soil, must always be the staple branch of her national industry, and the principal source from which she must draw her political influence and military power, will be found to have come out from the ordeal purified and refined, and the condition of her agricultural population in every respect greatly ameliorated.

It is not easy to ascertain the distribution of the land in France. According to Mr. Young, there are of arable land 70,000,000 acres; under the culture of the vine 5,000,000; in woods 19,850,000, in meadow and rich pasturage 4,000,000 acres; under lucerne, sainfoin, &c. 5,000,000; and the pastures and wastes occupy 27,150,000; thus making a total of 131,000,000 acres. This estimate, however, as far as respects the number of acres under wood, is certainly over-rated, though Mr. Young on this point follows the authority of Mr. Neckar; for a committee of the first National Assembly stated the whole extent of territory covered with wood at 13,100,691 arpents, of 100 perches of 28 square French feet each; whereas, according to Mr. Necker and Mr. Young, it amounted to 22,289,016 arpents. The general occupation of the land in the northern provinces of France, may be conceived, from the following account of the distribution of a small commune. Woods and meadows in the occupation of the proprietor, 250 acres; two farms let, keeping two ploughs each, together eight horses, 300 acres; 10 freeholders, keeping one plough each, together 20 horses, 750 acres; 28 freeholders, keeping no horses, occupying 250 acres; in all, 1550 acres, of which 1300 were arable. These are distributed as follows: under fallow 433, under wheat 433, under oats 433. Those who have no ploughs pay 40 francs (33*s*. 4*d*.) per acre to their neighbors for the team labor of the whole course, viz. four ploughings on the fallow, and one ploughing for oats; four loads of dung per acre carted on the fallow, and the harvest carting. Those proprietors who possess no ploughs are laborers, and in general work for the person who performs the ploughing of their land. The number of acres ploughed in this commune annually is 2165, or about 7½ acres per day for 14 ploughs, leaving sufficient time for harrowing, harvest, and the carting of dung.

The rent of land is low in most parts of France. Before the revolution, the rent of the arable and lucerne land was averaged by Mr. Young at 15*s*. 7*d*.; of the woods at 12*s*.; of the vineyards at 3*l*.: 16 : 6; of the meadows at 2*l*.: 3 : 9; and the wastes at 1*s*. 9*d*. At present, extremely good land in Normandy may be got for 30*s*. per acre; 18*s*. and 20*s*. are more common. In other districts, it is even very much lower. The price of land of course is proportionally low. Before the revolution, the average price of all the cultivated land in the kingdom, was estimated by Mr. Young at 20*l*. the English acre. In 1814, Mr. Birkbeck mentions an estate near Cosne of 1000 acres arable, and 500 wood land, let on lease for nine years for 375*l*. sterling, which might be bought for 22 years' purchase, or 8333*l*. It is proper to add, however, that one-third of the arable land of this farm was poor cold clay, of little value; two-thirds pretty good wheat land; part dry enough for turnips. In 1807, Mr. Pinckney states, that the average rents from Paris to Maine were about 15*s*. the English acre; and the purchase from 15*l*. to 18*l*. The value of lands in the vine districts of France, is much higher, amounting on an average to upwards of 60*l*. per acre, according to some authors; but others rate it only at 41*l*. per acre. The size of farms is in general small; few, even in Normandy and the other provinces where agriculture is conducted on the best plan, and with the greatest capital and skill, reaching 300 acres. With respect to the capital employed by the farmers, Mr. Young calculated it on an average of the whole kingdom, not to exceed 40*s*. per acre. In this, however, he was probably much mistaken. At any rate, at present, the average must be much higher. In French Flanders, it is calculated that a farm of about 250 English acres will require a capital of upwards of 1500*l*. sterling, or about 6*l*. 5*s*. per English acre. In this estimate, the livestock is supposed to cost 716*l*.: 16 : 8; of which 15 horses at 16*l*.: 13 : 4 each, 14 milch cows at 9*l*. each, and 180 sheep at 17*s*. 8*d*. each, form the chief articles. The instruments of husbandry form the next division of this estimate, and amount to 138*l*. Of these the large wagon is rated at upwards of 45*l*.; and lighter wagons, of which there are three, at nearly 20*l*.; four ploughs at 2*l*. 10*s*. each, besides a Dutch plough at 2*l*.: 12 : 6 :

the harrows, all of wood, at 8s. 4d. each. The third branch of the estimate is the servants' wages for 15 months. The number is eight; three ploughmen, one man to take care of the young horses, a shepherd, two women, and a swineherd; their wages, one with another, being 4l.: 11: 8 per annum each. The wages of the laborers are rated at from 8d. to 1s. per day. The maintenance of the 15 plough horses and 10 young horses for 15 months, is estimated at about 150l. It is probable that capital to the same amount is required in the other parts of France, where agriculture is well understood, and carried on with spirit and success. In the other districts, where it is far behind, of course the capital will be much less.

The prevailing opinion, that France is entirely an open country, is very erroneous. It is certainly much less inclosed than England. All Brittany, the western part of Normandy, and the northern part of that province as far as the Seine, most of Anjou and Maine, Lower Poitou, Touraine, Sologne, Berry, Limosin, the Bourbonnois, and a great part of Nivernois, part of Auvergne, and Quercy are inclosed. The whole district of the Pyrenees is thickly inclosed. This district of country comprehends 11,000 square leagues; so that if the other parts of France that are inclosed be added, they will raise the total to a full half of the kingdom. But though so large a portion is inclosed, the inclosures in general are ill-planned, and badly kept; and their value and utility so little understood, that the same rent is given for inclosed and open fields, provided both are arable. Perhaps the province of Berne exhibits more attention to the proper management of inclosures than most other districts of France. There is not a county in England closer, thicker, or better inclosed; and, what is uncommon in France, the gates and stiles are in good order. Commons are not met with in France, at least not in the same sense in which they occur in England; but common fields abound, and they are cursed with all the mischievous consequences which attend them in England, such as rights of common pasturage commencing on given days when under corn, and throughout the fallow year. There is a great deal of common field land in Picardy, Artois, part of Normandy, the Isle of France, Brie, the Pays de Beauce, and along the whole course of the Loire. In this last district, the farmers are in the practice of making an exchange with the poor, who have the right of common pasturage. This they buy off, assigning an acre or more to every cottage in the parish.

It is a singular circumstance, that some of the poorest and least improved provinces, are precisely those which are best and most generally inclosed: hence it is easy to perceive, that the mere existence of inclosures is not in France, as in England, a proof of the advancing state of agriculture. The chief cause of new inclosures in France, is, that the communities in many parishes, in different parts of the kingdom, and more especially in the vicinity of the Pyrenees, being proprietors of the wastes, sell them to any person who applies for the property, in absolute assignment; in consequence of which, the purchaser has the power of inclosure: whereas, in the waste plains of Brittany, Anjou, Maine, and Guienne, the seigneurs are the sole and absolute proprietors, and they will not sell, but only feu their estates. Hence the waste lands remain unchanged and unimproved. The government of France, before the revolution, took some measures to enforce or facilitate a general inclosure with respect to some of the provinces, more particularly with regard to Lorraine, in 1764 and 1765; but the popular objections and prejudices against inclosures, had such weight, that at the commencement of the revolution, strong remonstrances were presented against them, and certainly the proportion of inclosed land has not considerably increased since that event.

The agricultural implements in general use in France are very rude and imperfect in principle as well as in construction; the plough in most parts is almost entirely of wood, and scratches and pushes forward the soil, instead of penetrating to any depth, or turning it over. In the vicinity of the Pyrenees, a light imperfect plough, similar to what the Romans used, and drawn by a pair of weak cows, is not uncommon. In the neighborhood of Toulouse, a better plough is seen, of pretty good construction, to which two strong oxen are yoked, the ploughman driving them by means of a long staff, that answers the double purpose of a goad and a paddle. The use of oxen in the plough is pretty general in France, and they are yoked in a different manner from what is practised in England: A piece of wood, of about one-sixth of the weight of an English yoke, is put across the forehead of the cattle, the extremities of which are neatly hollowed out, so as to fit the mould of the head, and the hollows lined with a piece of woolly sheep skin, to answer the purpose of a soft pad or cushion. This light and easy yoke is braced to the horns with a small thong of leather, to the middle of which the beam of the plough is attached; the animals are thus completely equipped for their labor. It seldom happens that more than two oxen are yoked in a plough. In the north of France, as well as in some of the eastern, western, and middle provinces, horses are more commonly used than oxen; generally two horses, but in some instances three. Besides the plough that is used for the general purposes of agriculture, in several districts, both in the north and south of the kingdom, a little plough called a *binot* is employed, principally for the purposes of fallowing and destroying the weeds. In some respects the *binot* resembles a plough, with a double or scuffler share, and two mould boards, but it has no coulter. In the French Netherlands, were agriculture is carried on in a regular and systematic manner, some farmers have three binots to eight ploughs, some two binots to five ploughs, and some two to four ploughs. Only one ploughman and two horses are employed; the furrow which it makes is from five to six inches in depth. Its operation is different from that of the common plough, since it does not turn over the land, but elevates it into small ridges, by which means the weeds are exposed to the action of the frost and of the dry weather. After the binot, the land is always ploughed for the seed furrows. The harrows, in general use, are equally imperfect in principle and construction with the ploughs, and have always wooden teeth. In most parts of France rollers are unknown, and their use is supplied by a plank, on which a boy rides over the land. Their carts and wagons display equal ignorance of mechani-

cal principles, being in general of enormous length; the carts which are used for the carriage of goods, are not above two-thirds so wide, and certainly two-thirds longer than those in England; they travel in large companies, frequently 16, 18, or 20 in a string together, especially in the south-east of France, each drawn by a single horse, with about half a dozen drivers attending them. The *charette*, or cart in common use, consists principally of two parts—the carriage and the body; the carriage part is very simple, being composed of two long shafts of wood, about 20 feet in length, connected together by cross bars, so as to form the bed; on this the boards are laid, as occasion may require: in the same manner, the sides, a front and back, may be added at pleasure. The axle and wheels are in the usual place and form. The moveable body is fixed on this carriage; it consists of a similar frame work, of two shafts, connected by cross bars. This body moves upon an axletree, and extending some feet beyond the carriage behind, it is let down with ease to recover its load, while the body, moving on a pivot, or axle, is easily purchased up from before.

In France, before the revolution, and even since that event, the construction and repair of the roads is entirely lodged with the government. The great military roads, especially that over the Simplon, are excellent, with respect to the principle on which they are constructed, the materials of which they are formed, and the whole of their execution. But the roads which were not necessary for military purposes have in many places been greatly neglected, although it was stated, in the year 1806, by the minister of finance, that more than thirty-five millions of francs were annually requisite for the reparation of the roads and public works. In 1809, a collection of laws was printed regarding the management of the roads; in which a law passed in the time of the republic, for establishing the use of broad cylindrical wheels, is strongly enforced. According to this law, the wheels of heavy wagons were to be nine inches three lines broad; and they are allowed to carry only a certain weight, which varies during the five winter and seven summer months. It was also enacted, that in those parts of the kingdom where the roads were paved, the passing upon the pavement should be suspended during those seasons when they were likely to be injured, and the side roads alone should be used. The weight allowed to be carried was not only to vary in winter and summer, but also according to the form of the wheels; and, in order to enforce this law, weighing engines were to be erected, and the owners of carriages exceeding the legal weights were declared liable to severe fines. But these laws have been very partially enforced; so that some of the best roads in France, under the old government, have fallen into complete disrepair. This has been very particularly the case with the famous chausée of Languedoc, which begins at Villeneuve, whence it crosses the whole province. The cross roads have suffered still more than the main roads since the revolution; and both have suffered more in the Atlantic departments, than in any other districts of France. Throughout the whole department of Finisterre, the cross roads are in a most wretched state. The roads, in several respects, differ from the roads in England; they are generally broad, always straight, paved, and planted on both sides with chestnut trees, poplars, walnut, mulberry, and other fruit trees. There are 28 principal roads from Paris to the boundaries of the kingdom. Turnpike gates and tolls have been established since the revolution, at the distance of five kilometers from each other.

The state of agriculture in any country may generally be pretty well ascertained from the rotation of crops which is pursued. If these are conducted on good principles, the agriculture can scarcely be very bad; on the contrary, if bad rotations are pursued, agriculture has made very trifling advances towards perfection. If we judge of France according to this rule, we shall decide, that, though over by far the greatest part of the kingdom agriculture is in a miserable state, yet in some parts it is well understood and flourishing.

We have already mentioned the divisions of France into districts, according to the nature of the soil; we shall now note the principal rotations pursued in each district. In the district of rich loam, two rotations principally prevail, according to one of which, in Flanders and part of Artois, there is no fallow, but a constant succession of crops. The most approved and productive rotation is found between Valenciennes and Lisle: it consists of wheat, and turnips after it the same year; oats, clover, wheat, hemp, wheat, flax, coleseed, wheat, beans, wheat. In the provinces of Picardy, Isle of France, Normandy, and the other parts of Artois, the usual rotation was not in general so good, consisting of fallow, wheat, and spring corn. In some parts of Normandy, however, fallows are not known; and in other parts, especially between Dieppe and Rouen, where the soil is a deep hazel mould upon chalk, fallow occurs only once in six years; the rotation being fallow, wheat, peas, vetches, flax, or rape seed: wheat, clover, oats. In the rich plain of Alsace, the fields are never fallowed; the fallow crops being potatoes, poppies for oil, peas, maize, vetches, clover, beans, hemp, tobacco, and cabbages. In the Limagne of Auvergne, one of the richest districts of France, fallows are partially used; but the usual rotations in other respects, are so severe, that only such a soil and climate could bear them; it is not unusual to sow rye after wheat, and wheat after rye. The latter grain is often sown on their best land; and wheat on their worst: a common rotation is barley, rye, hemp, rye: wheat is grown also after beans: two crops in the year are not unusual.

As soon as ever the maize district of France is entered upon, fallows disappear; that grain being cultivated in such a manner as to preclude the necessity of a fallow. In the plain of the Garonne, the usual rotation is maize, wheat; and here also is first found the culture of different species of vetches, which are sown both in September and in the spring; and, together with hemp and maize, assist in banishing fallows. Yet even in this highly favored district, rye is often grown where wheat might be cultivated with advantage. Turnips are a second crop after wheat and rye. The culture of the white lupin is common here.

In the heath district great quantities of buck wheat are grown, and in some parts parsnips: but broom is the great object and source of profit; the common course being broom sown with oats. The broom is fed for three or four years, and then cut; after it wheat is taken, then rye, buckwheat, and

oats, or broom. This last is cultivated for fuel, as the district has neither coal nor wood. When the land is exhausted by this mode of cropping, it is pared and burned, abandoned, and by some time recovered, that a succession of crops may bring it once more into the same situation.

In Gascony, the usual rotations are, maize, wheat and turnips; maize, clover cut once, and then ploughed up for maize again; rye, millet, haricots or kidney-beans; maize, rye, millet; and maize, rye, clover.

In the districts of the Pyrenees, where irrigation is practised with considerable skill, and on an extensive scale, fallow is superseded by the culture of clover, millet, maize and haricots. Maize, however, is not cultivated in such large quantities as in other parts. Two crops are gained every year; but where irrigation is not practised, the ground is fallowed, and afterwards millet, haricots, or barley sown for forage, before the wheat is put in. In Dauphiny, buckwheat is sown on the wheat stubbles; and, such is the earliness of the climate, that it is frequently in full blossom by the end of August.

The rotation in the stony district is particularly distinguished by the introduction of potatoes in some parts of it, as a preparation for wheat. Where this root is not cultivated on a large scale, and as a crop in regular rotation, the common course is fallow, wheat or rye, and barley or oats. In the district of chalk, the rotation in general is very bad. In the province of Sologne, it is fallow and rye: certainly the very worst and most unprofitable that can be practised on any land. In the district of gravel, especially in the Bourbonnois and Nivernois, the same wretched rotation is pursued. The district of various loams is chiefly distinguished by the introduction of turnips into the rotation; but, as we shall afterwards have occasion to remark, the culture of this valuable root is ill understood in France.

From this account of the most common rotations in various parts of France, it will be seen, that in general they are conducted on very erroneous principles; and that, even where they are good, the climate ought to have the merit rather than the skill of the agriculturist. In the south of France, the climate enables him to take two crops in the season. This advantage is, however, also derived in French Flanders entirely through the attention and skill of the farmer. The second crops in that district being carrots, turnips, spurry and yellow clover.

The following, perhaps, will give a sufficiently precise and clear view of the general rotations practised in France. The arable land, that comprises nearly the whole of the kingdom, with the exception of the vineyards, and a few tracts of mountain, may be divided into five classes, with respect to fertility of soil. The first class bears a crop every year, as in most parts of French Flanders, some parts of Normandy, the Limange of Auvergne, the neighborhood of Toulouse, and generally where maize is cultivated, or irrigation employed. The second class, which is rather inferior in point of soil, but is still good land, is cultivated with the intervention of a fallow once in six years, as about Dieppe and Rouen particularly; once in five years, as in some parts of French Flanders, and in a few other districts. The third class of land, of middling quality, which embraces a large portion of the kingdom, is managed on the old plan, of fallow, wheat, oats, or barley. The fourth, still poorer land, is fallow and wheat alternately; and the last class of land, where the soil is in general miserably poor, is cultivated in the round of fallow, rye, rest without grass-seeds. As it is probable that the three last classes of soil comprise half the cultivated surface, and as half of them are fallow, it appears that one-fourth of the whole country is lying in a state entirely unproductive. The best husbandry in France, then, is in the south and in the north; in the former, the goodness of the climate enables the agriculturist to raise maize and wheat alternately, and to have second crops of millet, clover, lupins, &c.; and in the north, the skill of the agriculturist has, in a great measure, banished fallow. On the whole, so far as respects rotation of crops, French agriculture cannot be much praised; and it will be seen, that the management of the principal crops is in general not better conducted than the rotation. Before, however, we proceed to notice the culture of particular crops, it is proper to mention, that the application of land to the crops best suited to it is not well understood. Even in many parts of Normandy, land that would bear heavy crops of wheat is not unfrequently sown with barley; and rye in many parts is sown, where the soil is admirably adapted for wheat. It not unfrequently happens, too, that rye is sown along with wheat; the consequence of which is, that, as the former ripens three weeks or a month sooner than the wheat, when the latter is reaped, almost the whole of the former is shed and lost.

Different kinds of wheat are grown in France; the principal of which are the bearded wheat, various species of the common winter wheat, and spring wheat. What in England is called hedge wheat, where it is of comparatively late introduction, has been long known in the north of France, particularly at Calais, Lisle, and Dunkirk; it is known there by the name of pullet wheat *(blè pullet,)* or white wheat, *(blanc blè,)* and it is regarded as wheat of the first quality. One of the best kinds of spring or summer wheat known in France, is called *blè tremois;* the real summer wheat, *triticum æstivum*—it is sown with success so late as the end of May, and yields a large increase. The straw, too, is excellent fodder. The produce of wheat in France per acre is small: Even in the best cultivated districts, and on the best soil, it cannot be averaged at more than 18 or 20 bushels per English acre. In most places it is reaped; this operation being performed, like the other agricultural operations in France, chiefly by women. In other districts, however, it is mown: the whole process of harvesting is very carelessly performed. In a good year, in Picardy, 40 sheaves are calculated to produce a septier of wheat of 240 lbs. The principal wheat districts of France, are French Flanders, Artois, Picardy, part of Normandy, the Limagne of Auvergne, part of Alsace, &c. Beauce, a province which lies between the Isle of France, Bloisois, and Orleannois, and which now forms the department of the Eure and Loire, is so extremely fertile of wheat as to be called the granary of Paris. The wheat of Narbonne is in high repute for seed.

Barley is not extensively or judiciously cultivated in France. There are two sorts: the one which the French call square barley, or barley of

autumn, because they sow it in that season; the other is called spring barley: This is the common sort sown in France; they begin to sow it towards the end of April. This grain is the common food in many parts; either made into bread by itself, or mixed with wheat flour. It is also made into peeled barley: the best peeled barley comes from Vitry-le-François, a considerable town in the department of Marne. Good peeled barley is also made at Charenton, near Paris. Respecting the culture of oats, there is nothing that calls for notice. Rye, as it may have been observed from the rotations which have been specified, is very generally cultivated, principally for its grain, but in some places as green food. In the latter way, the ridges of the wheat stubble are split down, as early as possible after the crop is off the ground, and rye is sown, which in April or May is cut for the cattle; and, if the weather proves favorable, in some parts of France it is mown three times. The rye in France is very liable to a disease called *ergot*, which seems to be unknown here; and which produces, in those who eat the grain so affected, the most dreadful complaints. The average produce of rye, when reaped, is very small, perhaps not more than 15 or 16 bushels the English acre.

The annual produce of wheat, rye, barley, and oats, which may be considered as the chief arable products of France, has been differently estimated; and, indeed, only an approximation to the truth can be looked for on this account. According to Vauban, in his time, the annual produce of these grains was 59,175,000 septiers of 12 Paris bushels, or 240 pounds weight. According to Quesnay, the father of the sect of the economists, it was 45,000,000 septiers. In the opinion of the Abbé d'Expilly, 78,472,380. Lavoisier calculated it at 50,000,000 septiers; and Mr. Arthur Young at 75,000,000. The variations here are very considerable; but if we take the average of all these sums, it will give 61,519,672 septiers, as the annual produce of wheat, barley, oats and rye in France. The proportions of these different grains it is not easy even to conjecture, with any probability of approaching the truth. Rye and wheat are certainly produced in by far the greatest proportions; perhaps in pretty nearly equal proportions. Barley and oats are cultivated on a very small scale; the latter, especially in the south, from the too great heat of the climate, are not so much grown as in the north, and where grown, are in general unproductive.

Beans, such as we cultivate in England, are principally grown in French Flanders; besides these, the French grow what they call *feves de marais*, or beans of the marsh, which they eat only when green and fresh. They also dry them, but in that state they serve only as food for cattle. Some persons eat them in Lent; buying them green, and peeling the skin off, they split them in two, and dry them in the open air. Haricots or kidney beans are pretty generally cultivated as a fallow crop; they are carefully hoed, and are very productive.

The limits of the maize district have already been noticed, in treating of the climate of France; and the importance of this grain in an agricultural point of view, has also been sufficiently pointed out, in the account of the rotations pursued in the south of the kingdom. It is planted in rows or squares, so far asunder that all necessary tillage may be given between them. A considerable part of the summer it affords, as it were, a rich meadow, the leaves being stripped regularly for oxen, affording a succulent and most fattening food, which accounts for the high order of all the cattle in the south of France. The meal of maize, besides being used extensively as food for man, is also employed for fattening oxen, hogs, and poultry. Thus it appears that this most valuable grain is a meadow to feed the cattle in summer, and nourishing food to fatten them in winter. In some parts of France, it is sown broadcast and thick, for the purpose of mowing to suit cattle. This practice is pursued in the northern districts, where the climate is not sufficiently warm to ripen it; and even in the southern districts it is not uncommon to sow it as an after crop, in the same manner, and for the same purpose. Near Rousillon, it is sown in May, to be cut green in August, at which time more is generally in progress, to be applied to the same purpose in December. In the north, it is sown in the beginning of May, on well dunged fallow, and cut when beginning to come into ear. An arpent will maintain four cows from June to September; and the wheat that succeeds is always good. Although maize is undoubtedly an exhausting crop, yet in the Pays de Basques, on the low and humid lands of that province, it is cultivated for three years successively without manures; and this mode of farming, which is particularly mentioned by M. Parmentier in his *Memoire sur le Maise*, is even recommended as good by that author.

As maize, where intended to stand for harvest, is always planted in rows, little seed is required; in general, only the eighth part of the seed which would be necessary if wheat were sown; and the arpent yields more than double of that grain. In some very fertile and well managed spots, an arpent has yielded 2400 pounds. It is commonly ripe in the month of September; and even when later, the grain is protected from the inclemency of the season, by its broad and strong leaves. It is usual in most parts of France, to spread it under the roofs of the cottages to dry; the eaves of the houses being made to project 10 or 12 feet from the plane of the walls for this purpose. When the corn is cut, it is tied up in bunches, and suspended from light rafters, horizontally placed under the shelter of these eaves.

Buckwheat is cultivated to considerable extent, particularly on the poorer soils; and being of rapid growth, sufficient time is allowed to clean the land, before the succeeding crop of wheat or rye is sown. It is much used as food for man; and, in some parts, as has been already noticed, as green food for cattle: in this case, it is a stubble crop.

A very few years before the revolution, considerable exertions were made by the intendants of the several provinces, to introduce the regular and general culture of turnips. They distributed seed, and published small treatises on the proper management, and great advantages of this root; but their exertions seem to have been in a great measure unsuccessful; for turnips are very little cultivated in any part of France. Mr. Birkbeck, who travelled in 1814 from Dieppe through Paris and Lyons to the Pyrenees, and back by the route of Toulouse, says he did not see a single acre of turnips, or even of *raves*, in his whole journey. That

they are not grown in the south of France, he ascribes to the extreme dryness of the climate. This undoubtedly would render them a very precarious crop; but when he assigns the severity of the winter in the northern districts of France, as the cause of their not being cultivated there, his reason does not seem equally good. In fact, they are cultivated in French Flanders, in Alsace, Lorraine, and in the other districts in the north and east; and it appears from Mr. Young's Tour, in 1787, 1788, 1789, that at that period they were not entirely unknown, even in the middle and southern districts. In the department of the Lot, *raves*, that is a kind of turnips with a carrot root, long, thin, and poor, are cultivated; These are also grown near Caen in Normandy, in the road to Bayeaux; and in Bresse, or the department of the Ain, where they are known under the denomination of *navets*. Between St Palais and Bayonne, many turnips are grown in a singular husbandry; the wheat stubble is either burnt by itself, or where it has not been left long enough, straw is spread over it, and then it is set on fire. The ground thus cleaned of weeds, as well as manured, is then sown with turnips. On the whole, however, the culture of this valuable root is very partially known in France; and where known, is miserably conducted, as no hoeing is ever given to it.

(To be continued.)

BEES.

From the Cultivator.

Mr. Keith, of Maine, in a communication to the Monthly Visitor, after describing several modes of managing bees, and the ill success that attended them, thus in substance gives the result of an experiment made by placing them in a garret. He finished a room in his garret impervious to rats and mice, to which was a door secured against children and intruders. In this room was placed a swarm of bees, the hive on a level with and near the places made for their egress and ingress. The young swarm soon filled their hive, and then commenced building all around it, filling in with the finest comb, and without the support of slate or bars, the space from the roof to the floor of their room. Mr. Keith, by the aid of a candle, was able at any time to inspect the progress of his apiary, and witness the formations of the column of comb. There was no swarming, and of course the work had the benefit of all their increase in numbers. After the second year of their operations, Mr. Keith commenced taking honey from the room, doing it in the winter when the bees were dormant, in the central parts of the mass; these external combs always composing the best and purest part of the store. For many years Mr. Keith's table was abundantly supplied in this way with the choicest of sweets, until in 18— his dwelling house was destroyed by fire, and his bee-hive, "containing at the least eight hundred pounds of honey, and of living beings a multitude which no man could number," shared the common fate.

From what we have seen, and have been able to learn on this subject, the mode of treating bees as above described is superior to most others, for the following reasons. It prevents in most cases any swarming; the bees are not as frequently attacked and destroyed by the bee-moth; there is no necessity of destroying the bee as is the common but cruel practice; and the store of honey is always at command. The honey bee is one of the most valuable of our manufacturers; and that, and the silkworm almost the only insects that contribute by their industry to the comfort of man.

PROCEEDINGS OF THE TOBACCO CONVENTION.

[When giving a place to the following report, on a subject so interesting to all tobacco cultivators, we cannot but express our surprise, as well as regret, that not one person from Virginia attended the meeting. This is another and a striking example of the complete torpidity of the agricultural class of Virginia, in all matters relating to their peculiar interests and duties.—Ed. F. Reg.]

From the National Intelligencer.

Washington, Friday, May 1st.

The convention of the tobacco planters of the United States assembled in the chamber of the board of aldermen, at the City Hall, this day.

Delegates were present from Maryland, Virginia and Kentucky. Delegates had also been appointed from North Carolina, Tennessee, Missouri, and other states, but had not arrived.

At 12 o'clock, the convention was called to order by Mr. Jenifer, of Maryland who said that he had to announce, with great regret, that he had received a letter from Governor Barbour, the president of the convention of tobacco planters held three years since, and who still, had he been present, would have been the presiding officer, stating that he would be unable to attend, in consequence of duties detaining him at home, and expressing the regret which he felt at the circumstance.

Mr. J. suggested, therefore, that the convention should now appoint a president, with a view to organize and proceed to business. And he nominated for that office Gov. Sprigg, of Maryland; who was unanimously appointed.

The President having taken the chair—

Mr. Jenifer suggested that the convention now proceed to appoint a vice president and secretary. And he would nominate for the former office a gentleman who, although a stranger among them, came there highly recommended by his character and position—Mr. Benj. Jones, of Petersburg. This nomination was unanimously agreed to.

On motion of Mr. W. T. Wooton, of Maryland, Mr. J. S. Skinner, of that state, was appointed secretary.

And on motion of Mr. Thomas T. Somerville, of Maryland, Mr. John Mercer of that state was appointed assistant secretary.

The convention having been thus organized—

The president said he presumed it would probably be within the contemplation of the convention to appoint a committee at this time, for the purpose of taking the subject upon which the convention had met, generally into consideration; and who would be authorized to report at any hour to which the convention might adjourn to morrow.

The convention was then addressed by Messrs.

Jenifer, of Maryland, Triplett, of Kentucky, and Keech, of Prince George's county, Maryland; and, also, by Mr. Dodge, the agent appointed by the government to visit Europe for the purpose of procuring information on the subject of the tobacco trade, who laid before the convention some interesting statistical statements, the results of his investigations.

After which, Mr. R. W. Bowie offered the following resolution:

Resolved, That a committee of —— be appointed by the president to consider and recommend such measures as may be deemed must expedient to be adopted, to accomplish the objects contemplated by this convention.

Mr. Triplett suggested, as an amendment to the resolution, the addition, at the end thereof, of the words "and that the committee he requested to make report at 11 o'clock A. M. to-morrow."

Mr. Bowie accepted the modification; and the resolution, as modified, was adopted.

And the blank was ordered to be filled with the number *ten*.

The President announced the following gentlemen members of the committee:

R. W. Bowie, chairman,	Wm. J. Blackstone,
Thomas A. Somerville,	John Mercer,
John Barnes,	Baruch Mullikin,
Benjamin Jones,	Edward Hamilton,
Thomas F. Bowie,	Alexander Keech,

Mr. Jenifer, after urging a punctual attendance to-morrow morning, suggested that any friends who were in the tobacco interest, and were in the city, be invited to attend, and that such members of congress as thought proper should attend also as members of the convention; which suggestions having been assented to—

On motion of Mr. Jenifer, the convention adjourned until 11 o'clock to-morrow morning.

HENRY GODFREY WHEELER.
Reporter to the convention.

Saturday, May 2, 1840.

Pursuant to adjournment, the convention re-assembled this day at 11 o'clock.

Mr. Jenifer offered a resolution, which was unanimously adopted, returning thanks to the mayor and common council for tendering to the convention during its sittings the use of the chamber of the board of aldermen.

Mr. R. W. Bowie made the following report:

The committee appointed by the convention of tobacco planters now assembled in this city, with instructions to prepare and report to this convention such measures as may be deemed expedient to accomplish the objects contemplated by the convention, beg leave respectfully to submit the following report:

The statistical statement, respecting the enormous duties and exactions imposed on American tobacco, which was laid before the convention yesterday morning, and which is herewith again presented as a part of this report, showing "that Europe levies a revenue of about thirty millions of dollars on about 100,000 hogsheads of American tobacco, which cost in the United States about seven millions.

These duties and exactions appear to be so enormous that your committee have thought it necessary to examine them with the greatest attention, and have come to the conclusion that, enormous as they are, the following facts show that there is no exaggeration.

Russia.

On examining the statement above mentioned, it will be seen that during three years, that is, from the 1st of October, 1835, to 30th of September 1838, the average direct exportations from the United States to that country amounted to 181 hogsheads but the actual consumption in Russia may be considered as much greater, and may be safely estimated at 458 hhds. annually, the difference over the direct importations arising from the entrepots of England, Holland and the Hance Towns, etc. The revenue derived from American tobacco may be safely estimated at about $64,000.

Holland.

The average direct importations of our tobacco to that country during the three years aforementioned amounted to 19,815 hogsheads, but large importations are annually made from England. In 1837 there were exported from that country to Holland about 1,500 hogsheads of American tobacco, so that the total importations may be estimated at 21,315 hogsheads of our tobacco, the greatest proportion of which was afterwards re-exported to Germany and other countries of Europe.

The consumption of Holland may be estimated at about 3,300 hogsheads of American tobacco: the duty is very trifling, but we have a right to complain—1st, of the unjust difference made between Maryland and the other tobaccoes of our country, for whilst Virginia, etc. are admitted at 12 1-2 cents, Maryland tobacco is charged with a duty of 14¼ per 100 lbs. American, and stems are assimilated to Maryland; and secondly, that none of our tobaccoes are admitted at the same favorable rate of duty as the tobacco of some other countries. For example: East India is admitted at 5 1-5 cents, Brazil at 8 4-5 cents, and that coming from the Ukraine and other countries of Europe at 11 3-8 cents per 100 lbs. American. The revenues derived from American tobacco in Holland may be estimated at about $5,600.

Belgium.

The average direct exportations of our tobacco to that country during the said three years was 2,457 hogsheads; the importations from England in 1837 were about 3,500 hogsheads of American tobacco; so that the total importations into Belgium may be estimated at about 6,000 hogsheads of our tobacco.

It is extremely difficult to form any correct estimate of the real consumption of American tobacco in Belgium, the smuggling carried on from that country into France being very great; besides, several hundred hogsheads are re-exported to Germany; but the consumption, your committee believe, may be estimated, in round numbers, at 4,000 hogsheads. The duty on American tobacco is, on Virginia, &c. 23 1-2 cents, on Maryland 26 2-3 cents, and on stems 26 2-3 cents per 100 pounds, American. These duties are far from being heavy; but still we find, in this case, the same unjust difference established between the Maryland and the other tobaccoes of our country. We likewise have cause to complain that the tobaccoes of some other countries are admitted at a less rate of duty than the American, for, on examining the Belgian tariff, it will be found that the East India tobacco is admitted at 10 cents, and

Brazil at 16 1-2 cents per 100 lbs. American. The revenue derived from the above quantity of American tobacco may be estimated at about $11,500.

Great Britain.

The average direct exportation of our tobacco to that country for the said three years has been 28,773 hogsheads. The annual average consumption may be estimated at 18,000 hogsheads American tobacco, which, by the calculations in the statement before referred to, render a gross revenue of $17,275,700. The duty of 3 shillings sterling per pound, equal to 72 3-4 cents, is enormous, and, if put on for sake of revenue, there is no doubt that it defeats its own object; for it cannot be doubted that, if this duty should be greatly diminished, Great Britain would be a gainer in the net revenue collected from it, inasmuch as it would necessarily lead to a proportionately increased consumption.

Great Britain should take into consideration that there is no duty levied in the United States on any of her produce or manufactures which can in any manner be compared with the enormous duty of 72 3-4 cents per pound, or over 800 per cent. on our tobaccoes; [and that this duty weighing particularly heavy on those sections of our country which have been the most favorably disposed to a low rate of duties in the United States, and it certainly becomes an important question for Great Britain to take into serious consideration whether she can expect that those sections of our country will continue to be favorably disposed to low rates of duties on British produce and manufactures should the government of that country continue to levy such an enormous duty on one of the principal staples of American industry.]

France.

The same observations may be applied to France as to Great Britain. In France, the monopoly of the Regie weighs still heavier on our tobacco interests; for, whilst in England there are 18,000 hogsheads consumed, in France, having a greater population, not much more than one-half of that quantity is consumed.

By the statement already referred to, it will be observed that the profits resulting from the monopoly paid into the French treasury by the Regie, in 1837, amounted to over eleven millions of dollars. These were the net profits, and if the expenses of the Regie, which are very great, should be added to that amount, there is no doubt that the gross revenue would be fifteen millions of dollars; and, as a considerable proportion of American tobacco is employed principally to mix with the native tobacco, in order to render the quality of the manufactured article more valuable, it may therefore safely be estimated that the revenue derived from France, either directly or indirectly, from American tobacco alone, amounts to five and a half millions of dollars, being probably more than double the amount of revenue obtained by the United States from all the importations into this country from France.

Spain.

In that country a monopoly of the Regie exists. The average exports from the United States, as will he seen by the statement already referred to, were 1,729 hogsheads. There were also exported from England in 1837 about 1,150 hogsheads of American tobacco. Large quantities, it is presumed, are also smuggled from Gibraltar; so that the total annual consumption of American tobacco may be estimated at about 5,700 hogsheads. From information before the committee, it is believed that the gross revenue derived from the Regie may be safely estimated at eight millions of dollars; and, as the American tobacco employed is in the proportion of about five-eighths of the whole, the gross revenue derived therefrom may be estimated at about five millions of dollars from American tobacco.

Portugal.

In that country a monopoly by the farm (that is, the right to deal in the article under a license sold by the government) exists. The direct average exportations were only 77 hogsheads, but the average exportations of our tobacco from England to Portugal may be estimated at about 80 hogsheads. The legal importations into that country may therefore be estimated at about 363 hogsheads annually.

The net revenue derived from tobacco through the farm was, a few years ago, as follows:

Amount of the lease to the farm, or persons or company obtaining the license for the monopoly, per year	$1,400.000
Amount of the import duty	195,116
But to the aforegoing there should also be added to the amount which the farm has also to pay to the government for pensions to the former officers of the old tobacco administration	24,677
	$1,620,093

And, as the quantity of American tobacco legally consumed, was about one-third of the whole manufactured, the net revenues from American tobacco may be estimated at about $540,000. Although tobacco can only be admitted on account of the farm, yet it is subject to a duty of $8 36 on American and $6 27 per 100 lbs. on Brazil.

Italy.

Throughout Italy monopolies of tobacco exist, either being a Regie of the states, or it is farmed out by the government.

In Sardinia, it is a Regie, and the profits from the monopoly must be very great.

In the Roman states it is also a Regie. The consumption of American tobacco may be estimated at about 300 hogsheads. The profits are unquestionably great.

In Tuscany it is farmed out. The consumption of American tobacco may be estimated at about 425 hogsheads, and the profits from the monopoly from that quantity at about $140,000.

In Parma, the American tobacco is employed in making the first class of snuff, and the consumption may be estimated at about 130 hogsheads. In 1834, the Government obtained a gross revenue of about $106,460, from all qualities of tobacco.

In Naples, it is farmed out. The quantity of American tobacco may be estimated at about 400 hogsheads and the revenue derived through the farm at about $400,000.

In the Austrian dominions, with the exception of Hungary, it is a Regie. The consumption of American tobacco may be estimated at about 4,000 hogsheads, which is partly imported into Trieste direct from the United States, but the greatest proportion is obtained from the entrepots of Holland and the Hanse Towns. The profits derived through the Regie must be very great.

In the rest of Germany, where a large proportion of our tobacco is consumed, the revenue derived from it may be estimated at about $1,200,000. The committee cannot conclude this report without calling the attention of the convention to the important fact that the average value of the tobacco exported to various countries of Europe was, from 1st of October, 1835, to 30th September, 1838, $7,267,794, and that, during the same period, the average value of our domestic produce exported annually to the same countries was $79,201,860. Hence it appears that the article of tobacco, the chief staple of those represented by this convention, constitutes in value about one-tenth of the whole export of our domestic produce to Europe; and it may be presumed that an equal proportion of the population of the country has a direct interest in, if not an absolute dependence upon the cultivation and trade of that important, and, hitherto, too much neglected branch of American industry.

In view of the facts and considerations here presented, the committee respectfully recommend the adoption of the following resolutions:

Resolved, That this convention views with deep regret, and sense of injury, the continued heavy burdens imposed upon tobacco imported from the United States into foreign countries whose products and manufactures are admitted into this country entirely free of, or at nominal duty. That this inequality is at war with that spirit of reciprocity by which friendly commercial nations should be governed, and that a longer submission to it by the government of the United States would be unjust to the tobacco planters, destructive of their interests, and evince a gross want of attention to their just remonstrances.

Resolved, That a committee of three be appointed by the president of this convention to draught a memorial to the congress of the United States, urging the adoption of such measures as may be best calculated to effect a modification or repeal of the high duties and restrictions in foreign countries upon tobacco imported from the United States; and that the senators and representatives in congress from the tobacco-growing states be, and they are hereby requested to use their efforts to accomplish these objects.

Resolved, That a committee of five be appointed by the president of this convention to draft an address to the tobacco planters of the United States, setting forth their grievances, and urging them to lose no time in memorializing congress to relieve them, so far as that may be done by national legislation, from oppressions already too long endured—and which, when they are fully understood, cannot be quietly submitted to.

Resolved, That this convention recognize with grateful satisfaction the measures which have already been employed, with auspicious effect, to procure the adoption by foreign governments of measures of just reciprocity in regard to the interests represented by this convention, and that they entertain and hereby respectfully express the hope that the government of the United States will persevere in its exertions to accomplish the reduction or repeal of the heavy duties and restrictions of which we complain.

Resolved, That a copy of the proceedings of this convention be communicated to the president of the United States, and to each of the senators and representatives in congress from the tobacco-growing states.

The report and resolutions having been read, a debate followed, in which Messrs. Dromgoole, Jenifer, R. W. Bowie, Triplett, Thomas F. Bowie, Hamilton, Keech, and Duckitt, participated.

After which, that portion of the report which is within brackets, was stricken out.

The resolutions were taken up seriatim and adopted; and the question being then taken on the whole, the report, as amended, and the resolutions, were unanimously adopted.

The president thereupon appointed Messrs. Jenifer, Triplett, and Benjamin Jones, of Virginia, a committee to carry out the purposes of 2d resolution.

And Messrs. Triplett, R. W. Bowie, Daniel Jenifer, George C. Dromgoole, and John Mercer, a committee to carry out the purposes of the third resolution.

On motion of Mr. Thos. F. Bowie, it was unanimously

Resolved, That, in the opinion of this convention, the time has arrived when a journal devoted to the great tobacco interest should be selected and patronized by this convention and all others engaged in its cultivation; and that the American Farmer (edited by J. S. Skinner, Esq.,) be selected as a suitable organ for the diffusion of information on this important branch of American industry.

After some collateral proceedings—

Mr. Triplett offered the following resolution, which was unanimously adopted:

Resolved, That the president of this convention have power, and he is requested, to call a tobacco convention when, in his opinion, the interest of the tobacco planters may require it.

Mr. R. W. Bowie offered the following resolution, which was unanimously adopted:

Resolved, That it be recommended to the tobacco planters, and all others connected with the tobacco business in the United States, to hold meetings in their respective districts to respond to the proceedings of this convention.

And the business before the convention having been now disposed of—

On motion of Mr. R. W. Bowie, it was unanimously

Resolved, That the thanks of this convention be tendered to the president and vice president of this convention for their able and dignified discharge of the duties of the chair.

And then, on motion of Mr. Thos. F. Bowie, the convention adjourned.

HENRY GODFREY WHEELER,
Reporter to the convention.

MILK.

From the Farmers' Cabinet.

From careful experiments and observations made by Dr. Schubler, professor of chemistry applied to agriculture, in the celebrated institution of Fellenburg, at Hofwyl, in Switzerland, he says, he found the morning's milk commonly to yield some hundredths more cream than the evening's, at the same temperature; and that in milking cows, this singular phenomenon is observed, that the milk obtained from one and the same milking, differs considerably in quality: that, contrary to what might

be expected, the milk first extracted, is not the best—but that which is obtained the last contains invariably the largest proportion of cream. To satisfy himself thoroughly on this point, he caused a meal's milk of one cow to be milked into five vessels of the same size, and then separately examined the milk in each in the order in which it was taken.

No. 1, or that drawn first, gave 5 per c. of cream.
" 2, - - - - - - gave 8 - do.
" 3, - - - - - - gave 11,5 do.
" 4, - - - - - - gave 13,5 do.
" 5, - - - - - - gave 17,5 do.

Making an average of the whole of 11,05 per cent.

He extended his experiments so as to test the quantity of caseous or cheesy matter obtained from different drawings of milk, which displayed a similar result—proving, in the most satisfactory manner, that the last drawings of the milk were constantly much richer, both in butter and cheese, than the first; and demonstrating in the most conclusive manner the vast importance to the farmer, of having *trusty* milkmaids, who will tug away as long as a drop of the precious fluid remains in the udder.

ADDRESS TO THE AGRICULTURAL SOCIETY OF CUMBERLAND.

By W. S. Morton, President.

[Communicated for the Register by order of the Society.]

GENTLEMEN—The deplorable condition of agriculture in our state has perhaps been the theme of as much idle declamation and fruitless regret as any other subject of general interest. Anxious inquiries have been instituted into the causes which have produced this condition, by some of our ablest men. The evil has been traced to various causes. The apathy of our legislature, in relation to the interests of agriculture, has been condemned. Our geographical locality has, by some, been thought to produce insurmountable obstacles to agricultural prosperity, inasmuch as we are, by it, precluded from a market for those crops best comporting with an improvement of the soil. Our failure has also been charged upon our eager fondness for politics and political excitement. We have also blamed our ancestors for cutting down and wearing out our best lands, and rearing us in opinions and habits unsuitable to successful improvement. In short, we have been disposed to throw the blame any where else but on ourselves. Wherever the reproach may be lodged, the evil still exists. There is now nearly the same cause for lamentation, over gullied and barren fields, and wide-spread wastes, as existed about forty years ago, when John Taylor was exerting his powerful and patriotic mind, for the improvement of agriculture. Indeed, it is highly probable, that although there may have been a multitude of instances of individual improvement, yet, that since that time, the soil of the state has, in aggregate value, greatly lost. With this belief, some have despaired of our good old commonwealth, and supposed that she was formed to shine, for a while, as "the mother of states," and was doomed then to wither and die, like the moth. But, gentlemen, in this cause, it seems something like treason to despair. We all can see that something is greatly wrong. Instead of searching for those on whom to throw blame, let us assume much of it to ourselves. The remedy, if there be any, must be sought by ourselves and our compeers. Let "*nil desperandum*"—"don t give up the ship,"—be our motto; let us often contemplate, how much the prosperity of our beloved country depends on the exertions of its agricultural class; let us double our exertions at improvement, and, rely upon it, brighter days will yet await us.

Among the many cures for the evils of which we complain, the organization of agricultural societies has generally been resorted to with most confidence. Such institutions, if wisely and zealously conducted, may produce the most happy results. The mere formation of a society, and the simple gathering of its members occasionally, unless each one resolves to exert himself in the cause, and to bring with him all that he possibly can, to throw into the common treasury of information, must end in failure. But has not each one of us trusted too much to the mere formation of this society, to produce benefit, without reflecting sufficiently on his own individual duties in it, and resolving to discharge them? Which of us at its commencement, finding himself in a region confessedly capable of high improvement, and surrounded by those whom any man might delight to consider his friends and neighbors, did not prognosticate more fruits from our association, than have yet been produced? We have entered on a field, new indeed in this region, and filled with many difficulties, but happily exempted from much that poisons the peace of men in other modes of consociation. In agriculture all are brothers. Each delights in the prosperity of the rest. Each is at liberty to follow, and to profit by, the example of his neighbors. Emulation can hardly degenerate into malignant rivalry and party spirit; the baneful genius of the age has no home here. Which of us, on deriving information from a brother member here, would once think of the party in politics to which he belonged? Indeed, were there no other benefits to be derived from agricultural societies, their meetings would be desirable, that their members might occasionally be overshadowed by the benign influences of social affection. Let us resolve, then, that we will cherish these influences, yea, let us resolve that we will make a new effort to secure the best benefits from our institution. Our own interests, the honor of our country, and the good of our country, imperiously demand this effort at our hands. Should we suffer the society to die from individual apathy, some few of us may go on with efforts to improve, but it will be in rather a lonely, unsocial way; without the cheering thought that our best friends and neighbors are wishing us success, and earnestly laboring in the same cause. With ardent and united endeavors, we surely could effect something valuable, and should we fail, the conciousness of having honestly striven will afford consolation. That we have as yet done so little, instead of discouraging, should stimulate us to renewed exertion, both to ascertain the causes of failure, and to remove them.

Col. Taylor has made this remark: "the chief obstacle to the success of a society for promoting agriculture in Virginia, in my view, is the morbid

aversion to writing on that subject for publication." This was addressed to the state society, whose chief object was to operate on the public, through the medium of the press. The remark certainly cannot be applied with the same force to county societies; yet such of their members as possess information which would benefit the public, cannot justifiably withhold it. But while our members, generally, should not be expected to write for publication, I doubt much whether the chief obstacle to the success of our society for the promotion of agriculture will not be "the morbid aversion," to writing for the *good of the society*. In our associated capacity, we can only benefit each other, by either written or verbal information. What is communicated in writing is the most valuable, as it is commonly prepared with more care and system, and the communications being the property of the society, can be referred to whenever it is desirable. Here permit me to express my strong approbation of that regulation of our society, which requires such a communication from each member, at our annual meetings. This alone, if it be faithfully attended to, cannot fail to render our institution both interesting and useful. There is scarcely one member amongst us who does not know something unknown to some, or all, of the rest. Could we, on meeting together, hear from each member an elaborate essay on some agricultural subject, or the details of some experiment carefully conducted and reported, we should spend the day more pleasantly and profitably than we have done in some of our comparatively silent meetings. The society might also, occasionally, have the pleasure of diffusing information considered valuable, by publishing some of these communications.

But, gentlemen, I trust you will pardon the remark, when I observe that it is rather too soon to complain of a deficiency of agricultural writing, while there is so little agricultural reading among us. The "Cultivator," published in Albany, New York, is an exceedingly cheap and valuable periodical. This, I believe, is taken by a goodly number of our members. "The Farmers' Register," published in our own state, which I consider cheap at five dollars, but which may be had for half* that sum, by punctually paying in advance of each volume, has on its list of subscribers the names of hardly half a dozen of our members. In these days, when it is so common for one to know and to say what other people ought to do, I suppose I shall hardly give offence, by observing that I should be highly pleased to know, that not only every member of our society, but every man who drives a plough in our commonwealth, was a subscriber for both of these works. The veteran editor of "The American Farmer," in Baltimore, has also returned to his old post, and deserves as much, at the hands of the agricultural community, as any man living. There is nothing very pleasant in the office, but I will volunteer as agent for either or all of these works, and trust I shall be able to obtain some subscribers. Most of us take political papers, which sometimes put us in an ill humor. Agricultural papers, so far as I can speak from experience, have a powerful tendency to soothe the temper. The one may therefore be prescribed as an antidote against the poison of the other. In almost all human vocations, it is expected that some apprenticeship shall be served, or some studious preparation undergone, in order to the proper qualification of the votary. In the learned professions, much and laborious study is considered indispensable. A knowledge of architecture is necessary for complete carpentry. Even the tailors, I understand, are beginning to cut coats scientifically. Possibly that may be the reason of the great increase in their rates of charging. Agriculture, alone, may be pursued without previous preparation, and without a constant effort to improve in knowledge. Reading, alone, certainly cannot make the practical and successful farmer; but it will afford him, in an easy and expeditious manner, information which his lifetime would be too short to learn from experiment.

Among the obstacles to the success of agricultural societies, has been enumerated the perpetuity of office in the persons of the same individuals. Rotation in office is said to be the life of republics. Life is certainly an article much needed at present by our society. I can hardly conceive of any thing better calculated to infuse this, than to place, at least, the higher offices in new hands. Your president should be changed once a year. The present incumbent, while thankful for past confidence, would gladly resign the chair to another.

I feel unwilling to close this hastily prepared address, without incorporating into it something of a practical character. There was a plough introduced into this region, about ten years ago, made by Clute and Reagles of Schenectady, New York, which, for strength and durability, for facility of draught, and the beauty and thorough execution of its work, I think unequalled by any thing of the kind I have ever seen. Indeed, I consider it as far before the best ploughs of other kinds, that I have used, as these are before some ploughs that I have sometimes seen, drawn by a pair of miserable horses, and not only driven, but mended very frequently by a negro boy, whose best implements for the operation were a few rusty old crooked nails, and a stone for a hammer. The owner of this plough was certainly not in the habit of making calculations.

In conclusion, gentlemen, permit me once more to urge a renewed effort for the prosperity of our society, and to tender to each, and to all of you, my most hearty wishes for your success in agriculture, and your success in every thing.

* On referring to the "conditions" of the Register, I find that I was not exactly correct in the above statement. Two new subscribers, or any old one, who will find a new one to join him, can get the work for half price, by paying in advance. See Conditions of publication.—W. S. M.

CURING HAY.

From the American Farmer.

In an early number of the Farmers' Register, instructions are given for curing hay, which I have adopted, and pursued advantageously for several years; and, as many of your readers may not have seen that work, perhaps this communication may result in benefit to some of them.

I prepare stakes seven feet long, and two inches in diameter, sharpened at both ends—hay cut in the morning, if the weather is clear, is collected by a

horse-rake in the evening. The foundation of the cocks are made three feet in diameter, and after being raised two feet high, a stake is run through into the ground, and the cock finished by putting hay over the top of the stake, and carried up in form of a cone. The stakes handle better by being smoothed with a drawing knife, and short hay forks are the best for the work. Orchard grass, and I suppose timothy and herds-grass, put up in this way, rarely sustain injury from rain or wind, and after two days' clear weather may be mowed away with perfect safety. If urgent business on the farm requires it, I do not hesitate to leave the hay out till a convenient season.

I cut no other hay but orchard grass: most persons prefer timothy; but if orchard grass be cut as soon as it gets into full bloom, it makes excellent hay, and if the first crop be not sufficient, there is a good chance for the second. The second crop is never so good in quality as the first, and a provident farmer ought never to rely on it, but may resort to it to supply the deficiency of his first crop. After the first crop is cut, if the land be kept clear of stock, for two or three weeks, it will afford excellent grazing, and after it is eaten down, if the cattle be removed, and it has the benefit of the September rains, it makes valuable pasture till December, and sometimes till Christmas. When butter is to be made in the fall, for winter use, the cows are always turned upon my orchard grass. I have never esteemed clover valuable for hay; it is not a healthy food for horses, though it does well for cattle. Sugar beets, with rough provender, corn shucks, (wheat or oat straw,) is their best winter provision. Red clover with the aid of gypsum on exhausted lands has been found a most valuable improver: but I have been of late inclined to doubt, after lands have been well improved by lime or marl, and putrescent manures, if red clover is not generally estimated beyond its real worth. When red clover is sown on our oat or wheat fields, it is not usually grazed till the middle of October. If clover is not sown on them as soon as the grain is secured, the stock is turned in, and the fields remain a hack pasture, until ploughed for another crop. In this district of country, even under this treatment, white clover will grow on our improved lands, but red clover would generally be extinguished the first season. I have heard experienced farmers say, that the great improving property of the red clover was in the tap root. This consists in the vegetable matter it contains, and if the same quantity of vegetable matter could be imparted to the soil from any other source, the effects I should think would be equal. Some years ago, upon the change of my system of farming, I was unable to make during the year a dividing fence between my wheat and corn field, and, of course, after cutting the wheat, the field was not grazed; it had been dressed the year previous with marsh mud, and the white clover was equal to what I have seen in the fall of the year on fields sown with red clover. Red clover often fails from a defect in the seed, or the season; and, if the oats or wheat upon which it is sown be luxuriant, it is liable to be smothered before harvest. White clover is indigenous, and on improved lands rarely fails: under any circumstances, and I think under provident husbandry would afford sufficient vegetable matter to keep them in healthy action. The last two summers I have spent some time in Pennsylvania —I conversed freely with some persons connected with the Philadelphia market, and found they esteemed white clover as more valuable for butter and beef than red.

The farmers of Maryland and Virginia have been marked for their improvidence, and among other proofs, a strong one is our dependence upon foreign states for our grass-seed. I have saved on my own farm clover and orchard grass seed, and I can say with confidence, they may thus be obtained at one-fourth of what they cost; and I confess with shame, that with this knowledge, I have generally depended upon the Baltimore market for clover seed. I warn our farmers against foreign seeds—By this means we have introduced the plantain, the St. John's wort, and the Richardson's pent; and if we add to it the Canada thistle, we shall have a heavy evil upon us. I have sown this spring but little clover seed; I purpose to keep my wheat fields, or some of them, clear of stock till late in October, and not graze them next year, till the month of May. I am very sensible that my speculation in relation to red clover, is contrary to received opinion—I do not advance it with confidence, and I desire to test it. Old Mr. Shandy thought there was nothing like a theory—I think an agricultural theory of little worth, unless its value be tested by experience.

WM. CARMICHAEL.

Wye, Queen Anne's Co., Md.
April 20, 1840.

SHEEP HUSBANDRY.

To the Editor of the Farmers' Register.

Although it can easily be demonstrated to the dullest apprehension, that no farming stock will yield greater net profit than sheep, when properly treated, yet we may venture to assert, that none are more shamefully neglected, especially in our own state. The loss among them by death, during the last winter and early spring, has been enormous; far indeed beyond any that the oldest man among us can recollect. Now, as this, I believe, has been entirely owing to a disease which, although very common, has not yet been distinguished by any technical name or physiological description, I will endeavor to point out the premonitory symptoms, for the benefit of such young farmers as may not have attended to them sufficiently, to take timely warning against their fatal consequences. The first is a striking convexity of the back, and a position of the head and neck, which give to the animal more the shape of the camel than the sheep. The next is an inward shrinking of the belly, which gives to that part an upward curvature, nearly parallel to the curve of the spine. Lastly, and when the case is nearly desperate, may be seen a drawing of the front and hinder feet towards each other, as if the poor, doomed creature, hopeless of all aid from man, was about to fall into the agonies of death. A post mortem examination, although rarely made, except by dogs and buzzards, always discloses a carcass the bones of which have nearly worn through the skin, and intestines almost as empty as the exhausted receiver of an air-pump.

Having described, as accurately as I can, what the doctors would call the diagnostics of this

hitherto nameless, but most desolating disease, I will take the liberty to call it the *venter vacuus*, or hollow belly; a malady, by the way, far more destructive to our poor sheep, than even the hollow horn is to our most wo-begone, skeleton-looking cattle. If their unfeeling masters could every now and then feel a few twinges of it, they would, at least, be taught *that* sympathy for their domesticated brute animals, which all men naturally feel, who are not themselves much less humane than both reason and duty require them to be.

A small portion of our farmers boldly assert that we ourselves are the sole cause of this deadly disease; and that nothing is more simple and cheap than the means by which it may be always and entirely prevented—to wit: dry shelters to protect them from bad weather; daily food of good long forage, with some grain, pease, or a due portion of such roots as they will eat; and salt sprinkled on tar, twice or thrice a week. Others, constituting, I believe, a considerable majority, would seem as strenuously to maintain, that their sheep are wiser than their masters in regard to shelters; that artificial ones make them unhealthy; and that browsing upon pine, cedar, and holly bushes, to warm their stomachs, with poverty grass and broom-straw to give them the necessary distention, is far better for them, than to save them the material trouble of catering for themselves, without which they are apt to become too lazy and plethoric.

But all badinage apart, I would most earnestly ask every man among us who owns sheep, if it is not highly important to them all to settle for ever, and as speedily as possible, this difference of opinion in regard to their proper management? The unanswerable proofs of the best practice are, and have long been, within the reach of every one who will take the trouble to examine them with a mind open to conviction. For if foreign publications on the subject should be objected to as unsuitable for us, enough and more than enough from the highest practical authority in our own country can be found to satisfy even the most skeptical. There are many of your correspondents who could exhibit these proofs, if they would only spare as much time as to write them out for your Register. But lest this method should savour too much of "book-farming" for some of our brethren, I will respectfully suggest another mode, in all cases where the communication cannot be made from the writer's own experience. For instance, when we go to our respective courts, as it is the Virginia fashion for nearly three-fourths of us to do on every court-day, business or no business, instead of spending the greater part of our time in those worse than useless political party wranglings, where all are clamoring together and none listening, let only one or two men in each county endeavor to obtain, from their friends and acquaintances, answers to the following questions:

Do you, or do you not, shelter your sheep from bad weather during winter and early spring?

Do you feed them well from November until April?

What is the average weight of their fleeces, and what the average loss of grown sheep and lambs within that period?

I presume that few would refuse to reply to such inquiries; and if their answers were arranged in a tabular form, as they might be, very concisely, such statements (unless I grossly err) would exhibit so striking a difference between the results of the opposite modes of treatment, as would not only astonish even those who suppose this difference to be greatest, but would for ever banish all doubt from every mind, unless it was of that stupidly obstinate character upon which neither facts nor arguments can make any impression. I pray you, sir, to endeavor to prevail on some of your friends to give you some such statements as I have taken the liberty to suggest.

If I may judge by what I myself know, and have heard from authority in which I fully confide, the average annual loss in our state, of unsheltered and poorly fed sheep, has rarely, if ever, been less than about 15 per cent. This last season, I am confident, it has been greater; while the fleeces of all such sheep, from the time of my earliest recollection, have not averaged more than three or three and a half pounds. With this statement, which I admit to be somewhat conjectural, although not entirely so, I beg your readers to contrast the communication of Mr. L. A. M. of Tompkins county, N. Y., in the 'Albany Cultivator' for this month (April.) He states that he "commenced the last winter with 535 lambs, and that up to the 21st of February he had lost but *two;* both of which were mortgaged" (as he says) "to the crows before foddered season commenced." This farmer, be it remembered, both shelters and feeds his sheep with great care. To his statement I beg leave to add one which was published several years ago, in the Richmond 'Enquirer,' from a Mr. Hill, of Caroline county, Va., a gentleman of unquestionable veracity. As well as I recollect, it was made two years following; and in each year the fleeces of his sheep, to which he paid great attention, averaged upwards of six pounds. The three best flocks, by far, that I myself ever saw, were, one in Prince William, one in King George, and one in Essex. All were sheltered and well fed from the commencement of cold weather to the end of it; and the last mentioned flock was housed every night throughout the year, in an old tobacco-house, which was swept out every morning. These sheep were uncommonly fine, and might well have been compared with any that I have ever heard of in our country.

To conclude, I beg you, my good sir, to remember that this communication, like all the others which I have ever made for your paper, is sent solely *pro bono publico*, and not for self-gratification. I submit it therefore entirely to your own judgment to determine whether it can render any service or not; for I never wish to occupy even so much as a square in your Register, unless I can do some good by it; and of this *you* must judge rather than

Your old friend,

JAMES M. GARNETT.

Essex, April 10th, 1840.

EPIDEMIC AMONG HORSES.

From the Carolina Planter.

A disorder is prevailing extensively among horses throughout the southern states—in North Carolina, South Carolina, and Georgia, it is very general, and we understand farther west.

The symptoms are an irritability of the whole

system—with feverishness, and in some cases actual fever—slight watering or mattering about the eyes—with a cloudiness about the cornea—languor—refusal to eat—slight husky cough with slight discharge from the nostril—swelling of the legs—stiffness in the loins and legs—sometimes only one leg being affected. It attacks in some cases with colicky symptoms—or the womb becomes excited and mares cast their foals—in others inflammation of the bowels comes on. Should the catarrhal symptoms not be controlled early, swelling of the glands of the throat and neck takes place with inflammation of the windpipe and lungs—high fever and puffing of the skin—the inflammation of the eyes increases and results in blindness—the stiffness of the limbs becomes worse—spasms come on—with intense fever, and inflammation of the brain or lungs takes place, and death follows quickly.

In many of the cases rest and light feed are all that is necessary. The disease continues but three or four days. In most of the cases which have occurred in our neighborhood the irritability of the system has been checked, and the disease controlled by a single large bleeding, and for safety we recommend it in all cases. In one case, where high fever was present, and highly inflammatory symptoms, with increasing stiffness in the limbs, great swelling of the legs, and disposition to spasm, with acute pain in the bowels, we saw eight quarts of blood taken from the neck, followed by an enema of two ounces of laudanum, procure immediate relief—the symptoms returning on the following day, eight quarts more were taken away, and a repetition of the laudanum two or three times gave permanent relief.

In one fatal case which we have seen, symptoms of intense inflammation of the trachea, lungs and bowels were present—in another inflammation of the womb.

We consider the disease as catarrhal—affecting the mucous membranes and glandular system—coming on with a general irritability of the whole system, which, unless immediately removed, is followed by inflammatinn of the most irritable organ of the animal—in some horses there being a greater disposition to have one organ affected than another, as is noticed in man—colds producing affections of the air-tubes, bowels, or rheumatic symptoms, according to particular susceptibility of individuals to take on disease of those kinds.

While noticing the present epidemic, we would throw out a few hints on the diseases of horses in general. Most of them are *inflammatory*, and the extraordinary power of the heart and arterial system requires, that where fever is present, the most vigorous depleting measures should be used at an early period. More horses die of inflammation of the stomach and bowels than from any other disease, and most persons who have given any attention to the subject, notice how very rapidly inflammation runs its course in a horse. This renders it important to attend to symptoms immediately, and we can scarcely go wrong in bleeding a horse with symptoms of colic or bots—and giving enemas of laudanum—frequently horses are lost by waiting for the operation of a purge—in twelve or fifteen hours inflammation will run on to an uncontrollable point, while ordinarily 20 or 24 hours will be necessary for the developement of the action of the cathartic; large bleedings followed by large doses (preferable by enema) of laudanum are more successful in controlling inflammation than any other means—and we consider this as the most valuable treatment in acute cases of this kind. In chronic affections cathartics or laxatives may be used beneficially.

A long controversy has occupied farriers and gentlemen who attend much to horses on the subject of *bots*. A great many insist that they are injurious to the horse and cause death—while others are perfectly convinced that they are harmless. Writers of high reputation are arrayed on both sides, and believe, (like the knights of the shield, who viewed it from opposite sides and fought about their difference of opinion) they may both be right. During a healthy state of the stomach it is covered with a secretion of mucus, upon which it is supposed the bot feeds;—when a horse is driven too hard, or eats too much, or drinks cold water when heated, inflammation of the mucous coat of the stomach is apt to take place—the secretion is frequently checked—the stomach in health is protected by the mucus from the mechanical irritation of the bot—but now its presence on an unprotected inflamed surface increases the inflammation, and disorganization rapidly follows—ulceration effecting what the bot is supposed to make, a perforation through the coats of the stomach or bowels.

This perforation we have seen where no bots could be found—and we have seen it in horses where bots were thickly present, and here we have invariably noticed the absence of the mucus. We frequently hear of soothing mixtures of laudanum relieving *bots* (as it is called)—and also of rubbing the chest and belly with turpentine giving ease. It is by quieting inflammation or transferring it to a less vital structure, and thus relieving the primary disorder.

It is much to be regretted, that medical gentlemen pay so little attention to the diseases of this noble animal. How many valuable lives might be saved, if they did not consider it beneath the dignity of the profession to be horse doctors!

"Of all domesticated animals, the horse has the most powerful claims on the sympathy and attention of the medical practitioner. The lawyer may construct his briefs—the parson may perform his clerical duties—and the merchant may grow rich in his counting house with little assistance from the horse; but to the medical man, this spirited and intelligent animal is as essential as the knowledge which he acquires in the schools, or the medicines which he prescribes for his patients. The horse is his companion and best friend in the town and in the country. He carries him proudly through the crowded street—he conveys him safely over the midnight heath. He shares with his master in all the toils, and in many of the dangers of professional life. He is as much exposed to the elements—more indeed than the physician and surgeon—and he is not exempt from many of the diseases to which his superior is liable. To inflammation, fever, rheumatism, organic disease of the heart, liver and lungs the horse is very prone; and the study of his maladies is as necessary to the medical practitioner in a pecuniary point of view, as it is interesting in a pathological."
—Dr. J. Johnson.

In England veterinary colleges have become frequent, and the later publications of the British

press show the estimation in which this subject is held. "The Society for the diffusion of useful knowledge" has published the best "history of the horse in all its varieties and uses," and we recommend it to the perusal of all medical practitioners and gentlemen who value a good horse.

So long as a horse is healthy and able to work he is highly esteemed, but as soon as he becomes diseased we are very apt to order him to "go to grass," or we think ourselves lucky to get some one else to take him off our hands. If a faithful servant were to become sick, and we give him away to get rid of the trouble of keeping him, we should be considered unjustifiable and cruel, but with a dumb beast of a horse there is nothing wrong in it and we dismiss him from our thoughts as we do from our presence. This is a common practice, but we know of many exceptions, and take pleasure in stating the fact. The improving spirit of attention to fine stock is correcting the abuse elsewhere. We trust that it will do so with us.

ON THE CULTIVATION OF CORN. PULLING FODDER. MORE ABOUT BADEN CORN. APPLE AND PEAR CUTTINGS. MULTICAULIS. DEEP PLOUGHING.

For the Farmers' Register.

South Carolina, April 10th, 1840.

Cultivation of corn.—Being opposed to the absurd doctrine, that by cutting or breaking the roots of a plant you thereby promote its growth, and believing, that in the cultivation of the corn crop too many *deep* ploughings are usually given it, I have felt anxious to make an experiment in a different mode of culture, but until the last year have, by the influence of custom, been deterred from attempting it. On reading the first article in the first number of the 7th vol. of the Register, written by Mr. W. P. Taylor, I was, however, happily relieved; and so well was I satisfied with his mode of culture, that I at once resolved to risk, not only one field, but my *whole* (home) crop on it.

Advocating the practice of deep covering, though not so deep as recommended by Dr. Hardin, I will here remark, that my corn, on all suitable ground, was covered by ridging on it with the twisted shovel, and afterwards (in six or eight days) the ridge was lightly cut off with a board fixed on the foot of the plough stock in the place of the plough.

My first furrows were run, after the corn came up, in those on each side of it, (which had been made by covering it, and partly refilled in cutting off the ridge,) with the twisted shovel, throwing from the corn; and in the after culture I pursued Mr. Taylor's practice throughout, using the side harrow (with three teeth, flattened, pointed, and bent at the lower end, to cause them to enter the ground) in the crop work, in place of his cultivator; and the twisted shovel plough to bed up with, instead of his bar-share.

In my fresh fields, on which the logs have not yet decayed, (for I have not directed a log heap to be made or burnt in the last two years,) the plough and harrow were run alternately in the same direction; in which direction all the logs, after having been cut in suitable lengths, are turned, to prevent their being in the way of the plough, or occupying any part of the row, to the exclusion of the corn, it being planted at regular and suitable intervals, according to the strength of the land, though not on cross furrows, as is the practice on my old fields. To enable small hands to drop corn at regular distances, when the land is not checked off, I have caused a number of wooden compasses, or dividers, to be made so as to subtend different distances, say from eighteen to forty inches, and from two to three feet high. With one of these a hand can drop almost as fast as he can walk; having his basket of seed swung to the neck, taking out with one hand, whilst with the other he is turning his dividers, which, when turned, marks the spot for dropping the grain on.

Now, Mr. Editor, with my grateful acknowledgments to Mr. Taylor and yourself, for the valuable information I have derived from him, through the Register, I take much pleasure in saying, that, notwithstanding the very unfavorable crop of 1839, I have, in my corn crop, fully realized my most sanguine expectations. My corn "fired" less than I ever had it to do before; whilst the fodder on many farms in my neighborhood was *remarkably* "burnt" before the usual time of saving it.

My manager (an old man) says he never tended a crop with so much ease in his life; that he thinks he could cultivate half as much more land to the plough, in this as in the usual manner of cultivating a crop. And so well am I satisfied with the result, myself, I have directed my overseers at their different farms, on which I made the last year not less than *fifteen hundred* barrels of corn, to cultivate all in the same way the present year.

I attribute my success mainly to two causes. First, I was enabled rapidly, and *frequently*, to pass over my crop, and consequently, to keep the surface open, to promote the absorption of atmospheric moisture, which, at night, and in the dryest seasons, is more abundant than generally supposed; as well as to assist, by lightening the surface soil, the *transpiration* through it of the waters of the *sub*-soil, which, being more forcibly acted upon by the greater permeability of the earth, in this loose, porous, and lightened condition, to the rays of heat, afford a considerable resource of humidity.* And secondly, to the comparative little injury done the roots of the corn in the manner of its culture; the plough gradually forming a bed in one direction, for the roots to penetrate in their progress towards the centre of the spaces, whilst the superficial work of the harrow, in the other, kept down crop grass and weeds, and at the same time cut no *roots* but such as run very shallow.

It may be that cutting the roots of corn has a tendency to "multiply spongioles at the ends of the cut roots next the stalks, more than sufficient to compensate for the loss of the extreme feeders," as suggested by Mr. Garnett, (vol. 7, p. 4, Farmers' Register,) whose views generally I much admire, and whose writings I have had the pleasure of reading occasionally, for the last ten years. But if it were possible to avoid it, I would never cut the root of any plant in its culture.

Pulling fodder.—On this subject, I have no doubt, I am with many others, in preaching one thing and practising another; for I feel well convinced that much injury is done to corn in taking

* See Dr. Muse's statement, &c., vol. vii., p. 17, Farmers' Register.

off the blades, at the time when most persons do it, and as it is usually done. But as we are compelled to have something of the kind for our horses, and as it is a very common belief, (which I much doubt from small experiments of mine,) that we cannot raise clover and foreign grasses in this state for hay, we are forced to do that, that many of us believe is an injury to our corn.

For the benefit of those not averse to passing over their fields more than *once*, (and this is an objection with some of my neighbors,) I will state, that of late I have been in the practice of going over the whole of my corn crop *twice*, and very often *three times* over parts of it, before the whole of my blades were pulled. My orders to my hands are not to take a blade from any stalk the ear on which is not very perceptibly changed in color. And even then, up to the ear only, unless its external shuck is partly or quite dry, in which latter case, all are to be taken from the stalk. In this way I am confident I have done much less injury to my corn than is done in the usual manner of taking all before us. True it is, I have to pass through my crop two or three times; yet it is not so unpleasant after all, unless the corn is so sorry that I might wish to keep altogether out of sight of it. Besides, I get *more* and *better* fodder by so doing; for if we wait till all the corn is ripe enough, much of the fodder will have dried up and become worthless. On the contrary, if we go to work too soon, then the corn is the sufferer; and most of the earliest fodder in the last fields we reach will be lost: the time of taking it being prolonged by taking all before us.

I have stated above I doubted the commonly received opinion that we cannot raise *foreign* grass in this state. Admit it to be true, however. If we were to clear up the many worse than useless branch and creek swamps, on most of our farms, they would supply a much better article of food in the native grasses, than the *best* of our corn blades, to say nothing about the *worst*.

Baden corn.—I planted about two acres of Baden corn last spring, and although I did not measure the product, it certainly yielded at least a third more than any other variety in the same field. The land was thin, and not manured since 1838, when it was in cotton. I have planted the present year a field of it, selected from those stalks having the most ears; and of another variety (a mixture of the Baldwin with the common flint, having a very deep grain on a small cob, taken from stalks having two or more ears,) in alternate rows, in hopes of improving the grain of the Baden corn, which is too short for the size of the cob, and at the same time preserving its prolific character. My seed was obtained from a gentleman in Georgia, who had received the previous year a part of a barrel, sent by the Hon. Jesse Cleveland, from Washington city, to some of his constituents in De Kalb county.

Apple and pear cuttings.—To such persons as may feel disposed to try the experiment, and be humbugged, as I have been, by those that have asserted, that apple and pear cuttings would grow, if treated and planted as multicaulis cuttings, I would say, apply your labor to some other occupation. For, out of one hundred, cut, waxed and planted, *secundum artem*, last spring, not a single eye of either succeeded. I had not much faith, I must acknowledge; for I had, some years since, tried sticking a cutting in an Irish potato, and the result was, that the potato grew, but the cutting died.

Multicaulis.—I have planted, the present season, about three thousand multicaulis cuttings, preparatory to commencing the silk making business on a small scale, another year. Many of my friends laugh at me, and say, "it is all humbuggery." A friend of mine writes me from Georgia, "I think, from your letters, that your symptoms of silk fever are '*rather alarming*.' I am of the opinion, however, that a few doses of multicaulis, worked off with silk-worm eggs, will restore you to health." Probably it may, friend B****; but I very much regret I did not take the multicaulis fever in 1832, when G. B. Smith, esq., offered to furnish twenty trees to any one wishing to purchase, at *one dollar per tree*. (See American Farmer, p. 81.) Then, if I had taken the "fever," and repeated the dose, it would certainly have proved the grand *panacea* to my pecuniary health. It would have enabled me to contribute liberally, which I should have done most cheerfully, to the Smith Fund; and thereby furnishing a *solid* token of respect, to one much deserving it.

Deep ploughing.—I should have stated in its proper place, that I am not opposed to deep breaking of land; on the contrary, I care not how deep the breaking is done, (even in the thinnest soils,) provided the soil be kept on top,* and for that purpose, I once constructed a plough with two coulters, to run in rear of the mould-board, and set as deep as I desired to break the subsoil, without turning it up and mixing it with the soil; the plough at the same time turning to the full depth of the soil. It answered a very good purpose in old land, that was clear of roots and stones; but required two strong horses to pull it, and laborious work for the ploughman. In new and rough lands, it could not be used to any advantage. It was consequently laid aside; and I now prefer, in thin soils, running the broad point coulter in the same furrow of a light, one-horse, turning plough, in which way the subsoil may be well broken without turning it up, in any kind of land.

In conclusion, sir, if I could write better, I would write oftener; but my great desire to promote the interest of that most useful, and much neglected class of the community, the agriculturists, will, I trust, be a sufficient apology, for intruding my bungling production on yourself and your very respectable class of readers. It cannot be expected, I know, that every farmer should be an elegant writer. And yet most of them may, in some sort of way, communicate their views, and the results of their experiments, so as to be understood, and possibly benefit others. S.

MODERN IMPROVEMENTS IN EUROPE IN SILK-CULTURE.

From the National Intelligencer.

The introduction of improvements in the silk culture will be much more readily effected among an educated and intelligent people, having no preju-

* See Gideon B. Davis's Essay, American Farmer, vol. xiii., p. 369. I once ruined a field by turning deep, according to the directions of Arator.

dices in favor of old modes, and every thing to learn anew, than among those whose uneducated minds have, by long habit, become wedded to particular usages. In the central and northern parts of France, the disadvantages of climate have been in a great degree overcome by art. The adoption of improvements in the construction of cocooneries, so as to insure warmth and that free ventilation so indispensable, have enabled them to obtain in the vicinity of Paris three times the weight of cocoons from a given quantity of eggs that is the average produce in the southern departments, the consumption of leaves being at the same time fifty per cent. less. At the model establishment at Bergeries de Senart, near Paris, under the direction of M. Camille Beauvais, the results obtained have indeed surpassed all anticipations. The silk is remarkable for its lustre and strength, and commands an extra price. With 1,000 kilogrammes, or one ton (2,240 lbs.) of leaves not sorted or picked, M. Beauvais has produced 90 kilogrammes, or about 200 pounds of cocoons. The mulberry plantations at Bergeries occupy about 35 acres of ground, and when they get into full bearing are expected to supply sufficient foliage to rear the product of at least one hundred ounces of eggs. M. Beauvais preserves his silkworm eggs not only to any period of the ensuing year most convenient to have them hatched, but even till the year following this, in which last case the eggs have been found to hatch perfectly well and go through all their stages with regularity and vigor.

By raising the temperature and increasing the number of repasts, he accomplishes his feedings in from twenty-two to twenty-four days, thus saving much valuable time and labor which may be devoted to trimming mulberry trees and other objects connected with the business. The rapidity of the rearing has not been found to impair the value of the silk. M. Beauvais has exerted himself to diffuse all the information upon the subject which his opportunities enabled him to do. His cocoonery is open to all visiters, and, during two months of the rearing season, he receives gratuitously those who place themselves under him for the benefit of his observations and practical instruction.

Among the scientific individuals who have devoted special attention to the silk culture is M. Robinet, member of the Royal Academy of Medicine. He is director of the government model cocoonery at Poictiers, where he has distinguished himself by the success of his labors. He gives gratuitous lectures upon the silk culture every season at Paris. The course begins in February, and consists of two lectures a week, delivered on Wednesday and Saturday. Immense advantages must result from the lectures of Robinet, and the practical course of instruction by Beauvais.

In a recent report made by Bourdon to the French Minister of agriculture and commerce,* he gives a statement of the success obtained in cocooneries where the new modes of heating and ventilating have been adopted, to a greater or less extent, compared, in many instances, with results attendant upon the ordinary plans. He first presents the experience of the model cocooneries established in the departments of Drome and Vaucluse.

"In the first," says he, "at Faventines, near Valence, the beautiful race of silk-worms called white *Sina*, obtained from M. Beauvais, yielded a product of 78 kilogrammes (or about 171 lbs.) of cocoons, with a consumption of 1,000 kilogrammes (or about one ton of 2,240 lbs.) of leaves. Two races of worms, producing yellow cocoons, one from Piedmont, the other from Ardeche, gave 165 lbs. and 158 lbs. of cocoons for the same quantity of leaves.

"In the second establishment, situated upon the grounds of the Marquis of Balincourt, near Palud, (Vaucluse,) upon the banks of the Rhone, in a locality where the mulberry leaves are very watery and but little nutritious, M. Peltzer has obtained 132 lbs. of cocoons to the ton of leaves. He operated with the eggs of the white Sina, obtained under the superintendence of M. Aubert, in the Royal Domain of Neuilly, which eggs the king, in his enlightened zeal for the success of the silk culture, had requested to be placed at the disposal of the Marquis of Balincourt."

"The produce of the other cocooneries of this proprietor, managed upon the common plan, do not yield more than from 44 lbs. to 56 lbs. cocoons to the ton of leaves."

With some difference in the proportions of leaves consumed, similar crops of cocoons appear to have been procured by nearly all the feeders who have availed themselves of the salutary influences to be derived from a uniform temperature and constant renewal of the air. Thus M. Thannaron, member of the Agricultural Society of Drome, obtained on his estate, near Valence, 168 lbs. of cocoons to the ton of leaves.

M. Robert, at Saint Tulle, near Monosque, department of Lower Alps, obtained the following results: The product of eight ounces of eggs consumed 18,032 lbs. of leaves, and yielded 915 lbs. of cocoons of excellent quality. It must be observed that M. Robert only gave his worms the advantage of the new mode of ventilation after they had passed the third moulting. Not having net hurdles, his worms were fed on temporary board shelves.

Upon M. Robert's estate, the average product of feedings made by his tenants, who pursued the old methods, was only about 61 lbs. of cocoons to the ounce of eggs.

M. Mazade, jr. at Anduze, (Gard,) in operating upon 12 ounces of eggs, obtained 605 kilogrammes (about 1,331 lbs.) of fine cocoons with a consumption of 9,103 kilogrammes (about 20,000 lbs.) of leaves: that is to say, about 147 lbs. of cocoons for every ton of leaves consumed.

The same amount of foliage afforded him only, about 88 lbs. of cocoons in his other apartments, which, though superintended by himself, had not the advantages of that ventilation and artificial temperature, together with the perfect equality in the several stages and frequency of repasts maintained in the system of Beauvais and D'Arcet. The agricultural commission of Alais awarded a gold medal to M. Mazade, with the expression of its thanks, for the fine example set to his district.

The temperature maintained in the cocoonery during the experimental feeding of M. Mazade ranged between 77 deg. and 73 deg. Fah't. whilst the degrees of moisture ascertained by De Saussure's hygrometer varied from 65 deg. to 85 deg.

We learn from M. Mazade the highly interest-

* Annales de la Société Sericicole, 1838, p. 53.

ing fact that the *whole* amount of labor required in this rearing of the produce of 12 ounces of silk-worm eggs consisted of 111 days' work, of which those of men were 46, and those of women 65.

Now supposing the wages the same as those set down in Bourdon's calculations, namely, 40 cents per day for men and 25 cents for women, then will the whole expenses of labor amount to $34 65, which is much below the expense of rearing estimated by Bourdon, namely, $53 for feeding the produce of only ten ounces of eggs.

The 1,331 lbs. of cocoons, sold at 35 cents per lb. would bring $465 85, which sum, to those growing their own trees. would afford a handsome profit, even after allowing 50 or 100 per cent. additional for expense of labor, and saying nothing of premiums or state bounties. Supposing the cocoons reeled off into good raw silk, and sold at $5 per lb. the proceeds of the crop would be increased to nearly $700.

In estimating the costs of raising silk in most parts of the United States, the main items are for suitable buildings, fixtures, and labor, the charge for land being a very insignificant item, as the following facts will sufficiently prove:

The Rev. D. V. McLean, of New Jersey, actually raised last year upon one-fourth of an acre 2576 lbs. of leaves from multicaulis trees produced by roots and cuttings planted in April of the same year, with which leaves he fed worms enough to enable him to make twelve pounds of reeled silk. He states that his ground was by no means rich, and the trees small, though pretty close together. At this rate, more than 20,000 lbs. of foliage can be obtained from two acres of multicaulis trees, the first year of planting. Here is a fact of immense importance to us in the United States, and, for the clear demonstration of which to say nothing of other services he has rendered his country, we feel ourselves under great obligations to Mr. McLean. The multicaulis, and, indeed, any other variety of mulberry, will afford at least three times as much foliage the second year as the first.

The proportion of leaves consumed in M. Mazade's feeding, to the cocoons produced, is about 15 to 1; the same which Dandolo gives as the average consumption and product according to his experience. We have seen, however, that M. Beauvais has obtained, at Bergeries, near Paris, 1 lb. of cocoons to 10 lbs. of leaves, which is a saving of 50 per cent. both in foliage and the labor of gathering and distributing.

One of the most remarkable instances of success reported by M. Bourdon is that obtained by M. Planel, vice president of the tribunal of Valence, and member of the Agricultural Society. For many years his cocooneries had been almost entirely swept by the *muscardine*. After the adoption of the new system of ventilation, his worms not only escaped the devastating disease, but afforded him 350 kilogrammes (770 lbs.) of cocoons from six ounces of eggs, being at the rate of about 130 lbs. of cocoons to the ounce. The results obtained in two rearings, conducted in the two model cocooneries of Drome and Vaucluse, afford strong evidences of the happy influences spread by the system of Beauvais. Managed upon precisely the same principles, and under similar circumstances, as regards the interior of the cocoonery, notwithstanding the difference in climate, they progressed with perfect uniformity. Each age had exactly the same duration—that is to say, *five* days from the first, including the 36 hours of moulting, or sleep; *three* days for the second; *five* for the third; *five* for the fourth; and *six* for the fifth. The temperature during the whole time of the rearings was maintained, as nearly as possible, between 76 and 80 deg. Fahrenheit. The degrees of moisture varied from 78 to 85 deg. of De Saussure's hygrometer. Twelve repasts per day were given in the first and second ages, eight during the third and fourth, and six in the fifth age.

The examples here cited will suffice to show the advantages derived from the new system of rearing silk-worms, introduced into France by Beauvais and Darcet, founded chiefly upon the combined influences of a high and uniform temperature with increased frequency of repasts, and constant renewal of the air.

"It is true," (M. Bourdon observes in relation to this system,) "that the cares and attentions are multiplied; that very frequent removals of the litter are absolutely necessary; that the least neglect in the distribution of the repasts cannot fail to be attended with serious consequences. But, on the other hand, the duration of the attentions and anxious solicitudes of the feeder is abridged, the ill effects of changes in the weather diminished, the means of producing refrigeration—always more difficult to apply than those of procuring warmth—are provided. The rearings may be finished before the coming on of the *touffes*, especially in late seasons. Finally, the tree, being sooner stripped of its leaves, does not suffer so much as when these are gathered later."

It is very evident that, as this forcing system of rearing admits of no deficiency of food, and no delays in its distribution, a sufficiency of manual labor must be at command, in order to carry it out thoroughly. We will introduce a very short description of the model establishment at Bergeries, near Paris, which will give some distinct notions of the means by which the objects contemplated are accomplished.

The apartment destined to the rearing of worms is 72 feet (French) in length, by 22 wide, and 14 high. The furnaces and air chambers, for heating or cooling the air, are outside, and the warm or cool air is introduced at pleasure through pipes or flues, constructed of wood, and placed in or rather under the floor. These flues are pierced with holes at suitable distances, being made larger and larger in arithmetical proportion as they recede from the air chamber. Corresponding flues and holes are placed above, all of which unite in one general box communicating with a very large and high chimney, from which the communication can be cut off at pleasure by means of a valve or damper.

Before entering the chimney the upper flues lead into a box or kind of main flue, above which is another box provided with a ventilating fan or wheel, which forces, or, as it were, pumps the air from the cocoonery, when the draught of the chimney will not keep up a circulation sufficiently active. Before setting the ventilating wheel in motion, the valve in the main flue leading into the chimney is of course closed. The air drawn out of the cocoonery by the wheel is forced into the garret. Too much warmth, or the occurrence of a bad odor in the apartment, is the usual signal to set the ventilating wheel in motion.

The great efficiency of this plan of ventilating has been demonstrated by experiments, in which the cocoonery having been filled with smoke has been cleared by the draught of the chimney alone in about two hours, and by cutting off the communication with the chimney and turning the ventilating wheel at the rate of 70 revolutions a minute, the smoke has been drawn out in 32 minutes, or about one-fourth the time required by the chimney.

In the 'American Silk Grower,' recently published monthly by W. Cheney & Brothers, at Burlington, New Jersey, there is a detailed description, with cuts, showing the arrangement of the building erected by the government architect, for Count Grimaudet, on his estate at Villemomble, near Paris.* The scale of this building may be imagined from the fact that it is calculated to accommodate in one season the product of 80 ounces of eggs in each of its two wings. Its entire length is about 160 feet, by 50 wide. It is divided in the middle by a partition, forming two wings, each of which is furnished with an air chamber and all the appliances of a separate establishment. A basement story is appropriated to the drying of leaves, when this is requisite, and after the feeding is done, it is used as a filature, the reeling being conducted upon the system of Gensoul. The edifice is much more costly than would have been necessary for the mere purposes of a cocoonery. It stands in the midst of a beautiful park in the immediate vicinity of the chateau, and the Count has indulged himself in the display of considerable architectural taste. The proportions are harmonious, and the ventilating chimneys rendered quite ornamental. The attached mulberry plantations cover some 30 or 40 acres.

In addition to this splendid cocoonery, erected at Villemomble, in 1835, Count Grimaudet established another near Versailles, in 1836. This last, though not near so large as the one just referred to, is nevertheless a fine establishment, being 120 feet long, 27 wide, and 18 high; within, estimated to accommodate the product of 120 ounces of silk-worm eggs.

Should the rearings at Villemomble meet with the same success that has attended the new system in other places, Count Grimaudet will find his beautiful and noble establishment a source of great profit, notwithstanding the extra expense lavished upon it. Should he, for example, obtain at the rate of 150 lbs. of cocoons to the ounce of eggs, his 160 ounces would yield him 24,000 lbs. of cocoons. These at 35 cents per pound would be worth $8,400; from which sum deduct for labor at the rate of $53 dollars for every 10 ounces, as estimated by Bourdon, and the net profit left would be $7,550, a revenue which would richly compensate for a heavy investment in mulberry plantations, buildings, and fixtures. Reeling the silk would considerably enhance the profits, as the raw silk would doubtless sell for more than $10,000 after deducting the expenses of reeling.

In thus introducing to the attention of the American reader the new system of rearing silk-worms adopted in France, especially in the central parts, we do not wish to be understood as recommending its general employment here. Its great advantages in most parts of Europe cannot be doubted; for there, as we have shown, they have obstacles of climate to contend against that do not exist to any thing like the same extent in the United States. An examination of some of the details relating to the contrivances and experience in that country, where so much intelligence is now concentrated with a view to improve the silk culture, cannot fail to afford, either directly or incidentally, a great deal of highly valuable information. We are fully of the opinion that silk-worms always succeed best where they are kept at a pretty uniform temperature, provided the proper ventilation be preserved. Even in the fine climate of our southern and middle states, artificial warmth is necessary at times during the period of rearing, especially of mornings and evenings. For this purpose it will always be advisable to have one or more stoves placed on the northern or western side of a cocoonery, in which fire can be made as occasion may require. Or, what is a still better arrangement, a furnace and air-chamber in the basement or cellar, with flues running under the floor perforated with apertures for admission of the warm air. This may be effected with comparatively little expense, and without that multitude of holes recommended by D'Arcet. For an apartment 25 or 30 feet in length, eight or ten holes of moderate size will perhaps suffice. Instead of flues above to draw off the air, this, when too warm or vitiated, may be allowed to rise, as it naturally will, into the garret, and then escape through ventilators in the roof. Cocooneries having two stories are to be preferred.

As we regard the system of rearing pursued in Lombardy on the estates of Count Reina better adapted to the nature of our climate and other circumstances than any other with which we are acquainted, we shall give the description of it furnished by M. Puvis, a most intelligent French author, to whom we are much indebted for information upon this and several other topics connected with our subject.*

The estates of Count Reina are situated about two miles from the town of Come, in Lombardy, and, as before observed, the several cocooneries situated upon them are nearly all superintended by his daughters in person. Hence, the course pursued is called the system of the Misses Reina.

When the time arrives to hatch the eggs, they put them into small linen bags, and place these between two mattresses that are not slept upon. These are visited twice daily for the purpose of admitting the air to the eggs, and the hatching usally begins in eight or ten days. After the eggs have hatched, they are carried into the cocoonery, emptied into a small basket lined with linen, with a piece of tulle placed over the top, or, instead of this, a piece of paper perforated with holes about large enough to allow grains of wheat to pass through. Over this tulle, or perforated paper, young shoots of mulberry are placed, which soon become covered with worms. The young worms are kept near a stove, and a temperature of at least 77° Fahrenheit is maintained in the cocoonery, which should never be placed in a situation exposed to moisture.

* And also in the Farmers' Register, p. 77, vol. viii.

* Lettres sur l'Education des Vers a Soi, par M. A. Puvis, Ancien Deputé, Ancien Officier d'Artillerie, Membre de la Legion d'Honneur, President de la Société Royale d'Emulation et d'Agriculture de l'Ain, etc. etc.

During the two first ages, the worms receive ten repasts a day of fresh leaves chopped very fine. During the third and fourth ages, the number of repasts are reduced to eight per day, and to five during the fifth age.

The leaves are cut less fine during the third age, whilst in the fourth they are merely sorted or freed from the stems and fruit. The quantity given each time is sufficient to cover the worms with leaves.

The worms are one day without eating in the first moulting, two days during the second, nearly three at the third, and a little longer at the fourth. Some leaves are, however, given at the commencement of the moultings, for the support of such worms as are not sick.

The space which the Misses Reina allow the worms during the last age is much greater than that recommended by authors who have treated upon the subject, namely, 570 square feet (652 English feet) of shelves or hurdles for the ounce of eggs yielding 75 kilogrammes, or 168 lbs. of cocoons. This is more than double the room recommended by Dandolo, namely 170 worms to the square foot, or 183 French square feet (209 English) to 31,200 worms, producing 121 pounds (French) of cocoons. The space allowed ought to be so much the greater as the means of ventilation are less perfect, the warmth greater, and the removals of litter less frequent. As a mean, M. Puvis recommends 350 square feet (French) to the ounce of eggs.

The temperature of the cocoonery is at least 77 degrees Fahrenheit in the first age, but is reduced rather more than one degree each age, so that, in the third moulting, the temperature is about 73 degrees. At this time they begin to open the windows occasionally. During the warmest hours of the day, the ventilating holes are partially opened, and, if the weather be warm enough, no fire is made in the stove. During the fourth age, all the ventilating passages are opened; at the time of the fourth moulting, the windows are kept either entirely, or at least, half open; in the fifth age, and especially at the period of mounting to spin, all the windows and ventilating passages are left open night and day, *let the weather be what it may*, and, should the cocoonery not be capable of the freest ventilation, the worms must, if possible, be conveyed to some other and larger apartment. Where the whole of the worms cannot be removed, a part of them must be taken away.

By pursuing this plan, the Misses Reina obtain average crops of 75 kilogrammes of cocoons (168 pounds) to the ounce of eggs, and what makes the result more extraordinary, with a consumption of leaves equal to only 10 pounds to 1 pound of cocoons, being nearly equal to the greatest product obtained by Beauvais in his experimental feedings, aided by all the improvements and expensive appliances of the new forcing system of rearing.

This success is rendered the more remarkable by the fact that it extends throughout all the colonies upon Count Reina's estate and has been furnished every year for many years past, embracing good and bad seasons. M. Puvis thinks it is mainly to be attributed to the frequency of the repasts given in the first ages, to the large space allowed the worms, to the active ventilation kept up from the third age, and, perhaps, to the gradual diminution of the temperature of the apartment, especially during the fifth age and period of mounting to spin. The climate has, doubtless, some influence, but the system contributes still more, since the Misses Reina obtained a larger product than any of their neighbors.

This description of the admirable system pursued by the Misses Reina induces us to believe that the cocooneries of the count are of moderate dimensions, and dispersed over his plantation so as to form so many colonies. It is with silk-worms as with sheep or other animals, which, when too much crowded, always suffer from disease. The vital importance of ventilation, especially in the last age of the worms, is strikingly shown in the plan pursued by the Misses Reina. The object of placing the eggs between mattresses may be intended to keep them at a uniform temperature both day and night. The observation that the mattresses are not to be slept on at the time, refers to a custom in the south of Europe, particularly among the peasantry, of lying in bed with their silk-worm eggs for several days, to assist in hatching them. Others carry the eggs in their bosoms or pockets, with the same intention of subjecting them to the heat of their persons.

Whether any particular advantages are derived from the mode of hatching pursued by the Misses Reina may be a question; but, as it is extremely simple, and the results obtained from their whole system of management have proved so highly advantageous, it may not be advisable to omit any direction which can be complied with conveniently. We would lay particular stress upon the points of increased space allowed to the rooms, and the greatest possible ventilation in the fifth and last age, when the solid, humid, and gaseous exudations from the worms, as well as the gaseous emanations from the fermenting leaves and litter, are most abundant and extremely noxious to the insects. These emanations must be allowed to escape, at all hazards; and to close the windows and ventilating passages of a cocoonery during the last age, with the view of protecting the worms against a storm, would be, in the language of the fable, to shut up the wolf in the fold.

FRANKLIN.

From the Maine Farmer.

AGRICULTURAL PAPERS, &c.

[The writer of the following article has made a discovery which, however new to him, and scarcely suspected by the great body of the agricultural public, is no secret to any agricultural editor, whether he be one of those who share in the offence charged by the writer, or one clear of all such illegitimate gains, made indirectly from the entire confidence placed by the public in his editorial judgment, patriotism, and disinterested and fair dealing. We are pleased to see this first effort, however limited in its range and application, made to oppose this extended and still growing evil. It would indeed be well for the much humbugged and always duped public, if the whole system of editorial trading (and not omitting the

very important branch of buying and selling *puffs*) could be laid naked and made manifest to all.—Ed. F. R.]

Mr. Holmes:—At this time, when so many "new improvements" in the arts and sciences, as well as almost every branch of human industry, are put forth to the public, under the most imposing titles and captivating language, I think it will not be out of reason to throw out a few *hints* to my brother farmers, to be on their guard, and not suffer themselves to be imposed upon, by *interested* persons, in the sale of some of those "new improvements," which are almost daily, or at least every week, brought before the public—however specious may be their pretensions to the patronage of the community. For, sir, it is a fact, which cannot be controverted, and the more reflecting part of the community already perceive it, that we live in a day of *humbuggery*, or in other words, at a time when there are men, who are determined to take the advantage of the more ignorant, by ushering to their notice this thing, or the other, as "a great" or "decided improvement" in this or that branch of business, or something which is "new" or "well deserving attention." *This is done in various ways, but in none, perhaps, more successfully, or in which we farmers are made to feel so sensibly, as through the medium of some of the agricultural journals of the day, and especially those which are published by persons who are directly interested in the sale of those very articles or "improvements" which are advertised, and to which our "particular attention is invited" by the editor, under his* EDITORIAL HEAD.

You are aware, sir, that there are many journals published, with the imposing title of some "agricultural" term, in order to disseminate the advertisements of the proprietors, for the sale of these articles, or improvements, kept in their "agricultural establishments, seed stores," or "warehouses," and their great usefulness is thus trumpeted forth every week to the community. This is also done too, by persons who are sometimes hired at a certain price per week, or year, to conduct these journals, and I am sorry to state that rich persons are found, too, who are willing thus to lend their talents, and to prostitute their dignity, to aid in this species of deception, whereby we ignorant farmers are deceived, and thus deprived of some portion of our hard earnings. Indeed, we are made the dupes of this kind of people, by first subscribing and paying for their paper, thereby furnishing them with the very means to deceive us, and are led to purchase some of their "new improvements," or "valuable seeds," and finding that we have been cheated, after it is too late to apply the remedy, and in our turn, by thus lending our patronage, help to deceive others.

Not that I would be understood as discouraging the circulation of *agricultural journals* in the least, for I most earnestly wish that they might be increased tenfold or more. But I would advise every farmer to use the utmost caution, and subscribe for those papers, and those only, which have no connexion whatever with any "agricultural ware-house," "seed establishments," or the like, unless they are under the control of such persons whose standing in society is such as to be a sufficient guaranty to place them above suspicion, in resorting to any of those "artifices" or "tricks of trade," which are so boldly pursued by some.

If, sir, we should adopt this course, we should soon drive these worse than useless publications from circulating amongst us, not but that they may contain something that is valuable, but they are at the same time loaded with articles, in the shape of "editorial," "communications," or "advertisements," calculated to gull the public and deceive the community. And by lending them our patronage, we encourage them to pursue this species of deception, until by bitter experience we find we have been imposed upon, when, perhaps, our minds have become prejudiced, not only against this, but every other agricultural journal. We then discontinue that paper, and refuse, or neglect to subscribe for any other, thereby depriving ourselves of the benefits to be derived from well-conducted journals of this description, and we do not stop here, but suffer our prejudices to extend to *every* improvement, without in any way testing its advantages—thereby depriving ourselves of that kind of information and knowledge, which it is all important that we should have, in order to carry on our business to advantage.

In order to remedy this evil, I wish to exhort all my brother farmers not to subscribe for, or in any way lend assistance to, journals of this description, but to patronize such, and such only, as are *edited* by a person who is acquainted with the business of practical agriculture, and one too who is unwilling to prostitute his talents for "hire" to conduct a weekly paper, and lend the credit of his name to a journal, which is published by those who are directly interested, in the vending of all articles which are advertised by them, as well as praised by the *editor*, who is paid a stipulated price for doing it.

We want a paper published by a person who is not a *proprietor* or *copartner* in any "agricultural warehouse," "seed store," or "deposite of farmers' seeds and tools," and edited by a gentleman, who will not consent to lend the sanction of his name to puff any article whatever, any further than its real merit and intrinsic value will warrant. Such papers there are published, and to such we ought to afford support. They are the vehicles which serve to convey to us a vast fund of information, and will pay us all they cost fourfold.

Garland, March 5, 1840. Asa Barton.

From the Library of Useful Knowledge.

A GLOUCESTERSHIRE VALE-FARM.

Description of the Vale of Gloucester and Berkeley.

Between the Cotswold hills and the river Severn, there is a tract of low country, extending in length from Thornbury to Evesham, a distance of about forty miles; and of various breadths, from four to about ten miles. The surface of this district slopes gradually from the foot of the Cotswold hills to the Severn; and although its uniformity is considerably broken by several detached hills of the oolitic formation, separated from the main body; yet, in its general aspect, it may be said to be a level district. It is statistically divided into the vale of Gloucester and the vale of Berkeley.

The subsoil of this district is the blue lias-clay formation. Its course through this county is very

irregular and intricate, being bounded on one side by the waving line of the Cotswold hills, following the oolite up the valleys in all their windings; and being broken on the other by deposites of calcareous gravel.

The soil, on this formation, which is formed of clay with a mixture of vegetable matter in a decaying state, is very various, and is more or less productive according to the quantity of dead and decaying vegetable matter it contains. In some places, where it has been long pastured, and where a considerable portion of vegetable matter is mixed with it, it produces the richest pasture; but on other parts, it is very tenacious, poor, cold and sterile; and better adapted for pasture to young stock than for dairy cows or tillage.

The whole of this district being inclosed with hedges, having a great quantity of hedge-row timber in them, it has the appearance of being thickly wooded, as, indeed, it is in many places. The climate is not so early as might be expected, owing, we believe, to its clayey subsoil. Harvest is about as early on the Cotswold hills as in the vale, although they are at least six hundred feet above it. Dairy-farming is the universal pursuit in the vale.

Description of the farm.

The farm of Frocester Court contains between four hundred and five hundred acres, about four hundred of which are in old pasture. It lies in the vale of Berkeley, at the foot of the Cotswold hills, about eleven miles from the city of Gloucester, eight from the town of Berkeley, and five from the river Severn. Its general aspect is towards the north, having Frocester hill, part of the Cotswold range, on the south of it, from the edge of which it reaches about two miles from the river below. It is all inclosed with hedges and ditches. The hedges are for the most part broad, and composed of black and white thorn, hazel, &c. These hedges are very old, and probably have been formed by being left, when the ground was first cleared from its natural wood, with which the whole of this vale seems once to have been covered.

The soil is of two kinds. The one of these, on the sand formation, which lies above the blue lias clay, is of a light sandy nature, of a brownish colour, containing a considerable portion of vegetable matter, and naturally producing ferns, and good, sweet herbage. Its distance from the farm buildings, and its elevation being upwards of three hundred feet above them induce the farmer to keep it in constant pasture for sheep and young beasts.

The second kind of soil, which is upon the blue lias clay, is of various depths, and contains an admixture of vegetable mould and clay, thickly interwoven with fibre in a decaying state, decreasing in quantity as the depth of the soil decreases. The whole of this soil, where it is deep, appears to be full of vegetable matter, and where it is dry, or on a bed of calcareous gravel, it produces a most abundant herbage of the richest quality, which varies in its nature and richness with the nature and depth of the soil. A great portion of decaying vegetable matter in the soil would therefore seem essential to the production of rich pasture. The fields, which are nearest to the homestead, have been pastured from time immemorial. Some of these, having a subsoil of calcareous gravel, and being naturally dry, their herbage is of a quality superior to that of the rest of the farm, and they are thickly covered with the finest and most nutritive grasses.

The farm buildings are situated at the north-west side of the farm. These are a good dwelling-house, a dairy-house, feeding stalls for twenty-five beasts, two shades, several courts, stables, and a barn two hundred feet long and thirty wide, built about 600 years ago, and now used as a store for the best hay.

Management of fields.

The principal object of the dairy-farmer in the management of his fields, is the production of good pasture and hay for dairy-cows, and for raising as many young cows as will be required to fill up the place of those, which either from age or casualties fail in being productive milkers.

It is generally thought that grass-land should be pastured and mown alternately; and when the ground is never manured, this would seem to be the best way of managing it, unless, as is the case in most farms, there are certain grounds, which, when pastured by cows, produce not only much the greatest quantity of milk per cow, but also much the greatest quantity of cheese per gallon: these grounds the intelligent farmer will select for pasture to his cows in preference to all the others. Hence, on most dairy-farms, there are grounds that are always pastured, being those that are most productive of cheese, and, for the most part, nearest to the homestead. Of course there are, on such farms, other grounds, which are mown every year. With respect to these we would remark, that as, though frequently manured, they are sometimes apt to be overrun with yellow-rattle, a biennial weed, they should be pastured for at least two years in succession, and the ground should be skimmed over with the scythe, when the weed is coming into flower. This would completely extirpate it.

The poorest fields of this farm are seldom or never allowed to be pastured in the spring, as it throws them far back at harvest-time. Some of the fields that are manured, are generally kept for pasture for the sheep in the spring, upon which they are folded, and get a fresh portion of the field every day, by which means the grass is eaten up clean. When there is a scarcity of keep, this is sometimes continued till the middle of April or beginning of May, when the ground is cleaned, and shut up for hay.

Draining.—The whole of this farm has been drained. The draining plough has been resorted to, where the sub-soil of clay is near the surface; and, in pasture land, where the plough reaches the clay, this mode is both the cheapest and the most effectual. Turf-draining answers well, where the turf is strong enough to bear ramming; and where it is not, stone or draining tiles answer the best, but they are both more expensive than turf-draining.

Manure.—From the small quantity of arable land on this farm, there is very little straw raised and none of it can be spared for litter to the cows, when foddered in the several courts. The dung, therefore, that is collected in the court-yards is of the richest description, the whole of it having pass-

ed through the stomachs of the animals. It is frequently mixed with earth and the scourings of ditches, and is always carried to the mowing ground in the beginning of winter—in the time of a frost, if possible, that the turf may not be injured by the hauling of it over the ground.

The land which is pastured by cows is never manured, manure imparting a rankness to the grass, which not only gives a rank flavor to the cheese, but also makes it 'heave' or ferment, which is injurious to its quality.

There being a great deal of dung collected on this farm, the mowing ground is generally manured once in two years. The dung being spread over the ground with hay forks, is brushed into the ground, the first fine weather in February or March, with a brush-harrow, made of a heavy gate, between the rails of which thorns are fixed, and which is generally loaded with a log of wood. This brush-harrow is drawn over the ground by a horse, going at a very quick rate; and after it has done its work, all the stones and stricks are picked off the ground, which is then rolled and harrowed up for mowing.

Dressing or cleaning up the ground.—About the first of March, or earlier, if the weather is dry, they begin on this farm to clean up the pasture as well as the mowing grounds, and to 'hain' or shut them up, either for mowing or for the dairy-cows to be turned into in the end of April or first week in May. This operation is performed by men, women, or boys, with the common hay-fork, which with the back downwards, is swung right and left upon the dung, which the beasts have dropped during the time they were foddered in the field, and also upon the molehills, which by this operation are beat into small pieces, and at the same time, scattered over the ground, or rather rubbed into it. The waste hay, all straw, stones, sticks, &c., are picked up and carried off the ground, before it is rolled, in the end of March or beginning of April. The fields, when thus cleaned, are shut up, whether they are for mowing or pasture; and those grounds that are to be the latest mown are the last that are cleaned and shut up.

All the rough grass, which, the cows do not eat, is mown off, and the weeds cut up once or twice a year. The rank grass produced on those spots on which dung has been dropped in the spring the cows do not eat, and it is 'skimmed over' or mown, and made into hay for young stock in the winter. From these spots, after being mown, there springs a new crop in autumn. If they were not mown, the long grass would decay and get rotten at the bottom. These tufts of rank grass are, however, sometimes left, and eaten up by store stock in winter.

Hay.—The age or state of ripeness, at which a crop of grass is cut for hay, is of great importance, for on it depends the quality of the hay. The earlier it is cut, the better will be the quality of the hay, and the greater will be the quantity of the after-grass; and the longer it stands before it is cut, the greater will be the quantity of the hay, but it will be of an inferior quality, and the after-grass will be diminished in a much greater proportion than that in which the hay is increased. Early mowing, therefore, is always practised on this farm. The mowing begins the last week of May or the first week of June, when the grasses are in blossom, and when they are seldom more than six weeks old.

The mowing should be so performed, that neither the strokes of the scythe nor the junction of the swaths can be discerned. This is easily accomplished by fixing the scythe to the handle, so as to have it level with the ground during the operation of mowing, by not taking on too wide a swath, and by making the scythe come out a little beyond the standing grass every time.

The more expeditiously grass is converted into hay, and the more of the natural juices of the grass the hay retains, the better is its quality. It cannot be too often tedded or shaken abroad, while passing from a state of grass to a state of hay, particularly in the first stages of the process. The hay-machine, therefore, is of great advantage in the work; for besides that a boy and a horse can, with it, do as much work as eight men, it does the work with more expedition and much more perfectly, all the grass being completely separated and spread regularly over the ground to dry; and the hay, in consequence, is at least ten per cent. better in quality than that which is made by the hand.

The hay, in three or four days after mowing, if the weather is favorable, is either put into wind cocks or carried to the rick. The ricks of hay are made in those fields which are dry, and in which it is intended to fodder some of the stock during winter. The best hay is taken to the homestead, and either ricked in the yard or put into the large barn formerly mentioned, in which several hundred tons of hay can be secured.

[*Stock.*

Mr. Drinkwater S. Hayward has rented this farm for thirty, and his family for many years. He keeps a pack of a hundred cows, composed of the best milkers, or those from whose milk the greatest quantity of cheese is made; and in selecting calves for weaning to keep up his stock, he takes those of the best milkers. His stock is of a mixed breed; and that which he prefers is a cross of the Gloucester and the Alderney with a Durham bull, producing a stock half Durham, one-fourth Gloucester, and one-fourth Alderney. Having had the good fortune to get an excellent milker of the true Hereford breed, a very uncommon thing, he is proceeding in the same way with this cow, crossing first with an Alderney and then with a Durham bull. This stock of course is one-half Durham, one-fourth Alderney, and one-fourth Hereford; he expects it to be of a very superior kind, and not only excellent milkers, but of the finest symmetry and with high feeding properties; and from the present appearance of the stock, there is every reason to think this will be the case.

To keep up his stock of dairy-cows, Mr. Hayward weans thirty heifer-calves every year. Some of those that are weaned before March produce calves when two years and a quarter old, and all the others come in at three years old. Mr. H. has, therefore, a hundred cows, thirty heifer-calves, thirty year-old heifers, thirty two-year-old heifers, and thirty three-year-old heifers; which last take the place of thirty cows that are yearly drawn from the stock, and disposed of. These thirty cows consist of such heifers as have slipped their calves, or have proved "empty" or barren, and of aged cows, which are sold to graziers,

The young cows are disposed of as soon as possible; but the old ones are kept as long in autumn as their milk will pay for their keep.

Management of cows.—The cows are generally turned out to grass in the end of April or beginning of May, upon those grounds which Mr. Hayward has found, from experience, to produce the most and the richest milk. These grounds are nearest to the home stead, and have always been pastured. The driving of the cows before milking, and the carrying of the milk to any considerable distance, are found to injure the quality of the cheese; and to avoid this consequence, the pasture-grounds should always be, as on this farm, near the homestead.

The cows, on this farm, are divided into three lots, the young and weak ones being in one lot. Each of these three lots has two fields of pasture, and they are generally kept a week at a time in each field; so that they have fresh pasture every week—an advantage much greater than most farmers are aware of. Great care is taken never to overstock the pasture of the cows. They ought, at all times, to have a full bite of close, short, fine grass. Long overgrown grass gives a rank flavor to the cheese, and should always be avoided.

In dry seasons, when the pasture has got too short, some of the fields that were intended for mowing are given up to the cows for pasture. When the hay is all cleared off the mowing grounds, and the after-grass begins to grow (it generally takes several weeks to make much appearance,) the cows are shifted in these grounds. Land which is long pastured by any animal gets foul or unsound for it, and the after-grass always makes the cows spring their milk. They are, therefore, generally moved from the pasture grounds into the after-grass before there is much of it for them.

It is very essential for cows to have a shade and water in every field. The shade of large trees, however, is the only shelter from the sun and the storm, which they have on this farm, and indeed in the whole vale.

Cows should, in winter, be kept as warm and comfortable as possible. Every dairy should be provided with shades and warm courts for the cows; but in the vale there is scarcely an instance of accommodation of this kind for one-fourth of the cows, and there is not more on this farm. Hence most of them are foddered in the driest and warmest grounds; and before calving, they get hay served out to them morning and evening; but after calving, they are fed three or four times a day, and with the best of the hay.

Calves.—The calves are allowed to remain with their mothers for about a week after they are dropped, because the milk, during this time, would not do for making cheese. The best of the heifer-calves are selected for breeding. Such of the remainder as are dropped before March are fattened; those that are dropped after that time are sold young, as, then, veal generally becomes cheap, and milk is of more value for making cheese than for feeding calves.

After the first week, the calves that are to be weaned are parted from their mothers, and put on the calves' stage, a sort of crib erected in the calves' houses, which being raised one foot from the ground, and being open in the bottom, keeps them dry without the help of litter. Here they are allowed two quarts of sweet milk in the morning, and the same quantity in the evening, for the first six weeks. At the end of this period they begin to eat hay, some of the best of which is given to them; and, instead of milk, they get a mixture of sweet milk and water. They are turned out into some of the earliest and best pastures, as soon as there is any for them.

The whole breeding stock are distributed into lots, according to their ages, and kept apart summer and winter. They are kept either on the upper field of this farm, or taken to another farm on the hills, where they are treated in the same way as the breeding stock are on Beverston farm.

Sheep.—There are upwards of three hundred sheep kept on this farm. They pasture the upper field in summer; and in autumn and winter they eat up the rough grass left by the cows. The management of the sheep is the same as that practised on Beverston farm, to the account of which we refer the reader.

Pigs.—Upon this and every dairy farm, a number of pigs are necessary to consume the whey—one pig to two cows in summer, but not so many in winter. Their food in summer, is grass, clover, vetches, and whey; in winter, raw potatoes, with tailing corn, whey, and skimmed milk. When they are being fattened, bean or barley-meal is mixed with boiled or steamed potatoes, in the proportion of a bushel of meal to two cwt. and a half of potatoes. The breed of pigs kept on this farm is the Berkshire, with a small mixture of the Hereford. Some of them are sold in a store state; most of them are fattened. Five or six breeding sows are always kept, which are regularly fattened off, when one year and a half old, and fed to about three cwt.

Management of the dairy.

It is acknowledged by every one, at all acquainted with the subject, that the quality of cheese does not depend upon the superior richness of the the soil or the fineness of the herbage; for cheese of the first quality is frequently made from land of an inferior description, and from herbage of a coarse nature. Nor does the quality of the cheese depend on the breed of the cows, for cheese of the best quality is made from the milk of cows of all the different breeds that are to be found in the country: we think it principally depends on the management of the cows as to their food, &c., of the milk in converting it into cheese, and of the cheese, till it is fit for market.

The following circumstances are injurious to the quality of cheese: allowing the cows to get rank or ill-flavored grass or hay, these conveying a bad flavor to the milk and cheese—allowing the cows to run and heat themselves—driving them far to be milked, which makes the milk froth much in milking—carrying the milk from the place of milking to the dairy; and allowing it to remain long after it is milked, before it is set with the rennet.

The greatest dependence is upon the dairy-maid; and the chief art of making cheese of the finest quality lies in her management. The superintendence of the dairy invariably devolves upon the farmer's wife. Mrs. Hayward attends to every minute circumstance in this department, and the

following is a report of the information she has obligingly communicated to us respecting the whole economy of the dairy of this farm.

The management of the dairy should be conducted with the greatest regularity. Every operation should be performed precisely at the proper time. Either hastening or delaying the execution of it will cause cheese of an inferior quality to be made of milk from which the best may be obtained. A dairy-maid is selected for skill, cleanliness, and strict attention to her business. Her work commences at four o'clock in the morning, and continues without intermission till bed-time.

Dairy house.—The dairy-house should be kept at a temperature of between 50° and 60°; and the drier it is kept the better, as both milk and cream retain their sweetness much longer in dry than in damp air. Every time, therefore, the dairy is washed, it is dried as quickly as possible.

Around two sides of the dairy, there are broad shelves, made of elm, for putting the vessels that hold the milk and cream, and the newly made cheese upon. On another side there is a frame with three large stone cheese-presses. In the middle of the north side is the door; and in the corner, on the left, is the stair leading up to the cheese-lofts; and behind the door is a single cheese-press, which is generally used in pressing the cheese at first time, before it is cut down and put through the mill. In the middle of the floor stand three leaden vessels, large enough to hold all the whey of one "meal" or milking; and by the side of these stands the cheese-tub.

Above the dairy there are two cheese-lofts, around the sides of which there are broad shelves for holding cheeses; and in the middle stands a frame for holding two rows of boards, called here "cheese-tack," which being only about eight inches apart, contain a much greater quantity of cheese than could be disposed on the floor. The stair to the cheese-lofts is of oak, and seems to be the pride of the dairy-maid, for it is dry rubbed and polished so smooth, that it is dangerous to walk upon; but this sort of pride is encouraged as evincing an attention to cleanliness.

Along the north side of the dairy there is a shed, which communicates with the dwelling house. In this shed the utensils are kept upon a stand for the purpose, the cream is churned, and other work performed, nothing being done in the dairy, but the making of the cheese and the making up of the butter.

Opposite to the door of the dairy and detached from the shed, is a wash-house with a pump-well, at the door of it. In this wash-house, the water and the milk are heated in boilers for the purpose; and all cleaning work is performed.

Utensils.—The milking-pails are made of maple, on account of the lightness of the wood and its cleanliness of appearance. They hold about six gallons each, and the cheese-tub is of a size large enough to hold the whole of the milk. The ladder, the skimming-dish, and the bowl are of maple. The sieve for straining the milk is about fifteen inches in diameter, and has a hair-cloth bottom.

There are a number of cheese-vats, sufficient to hold all the cheese made in four or five days. They are made of elm, and turned out of the solid. That which gives five cheeses to a cwt., is considered the best size for double Gloucester, the inside diameter of which is fifteen inches and a half, and depth, four and a quarter; and that is considered the best for single Gloucester, which gives eight to a cwt., the diameter within, being fifteen inches and a half, and depth, two and a half. Round boards, called "suity boards," made of elm, of the diameter of the cheese-vats, and thicker in the middle than at the edges, are occasionally necessary to place on the cheeses, when in the press, if the vats are not quite full. Without the assistance of these boards, the cheeses will be round in the edges, (a proof of not being well pressed,) and not so handsome.

The cheese-presses are made of stone, as being the cleanest material for the purpose, and of steadiest pressure. They weigh about seven cwt. each; they are raised by a block and tackle; and the whole apparatus is painted white.

From the whey leads, which are oblong and about eight inches deep, there are leaden pipes which convey the whey into an under-ground cistern, near the pigs' houses, where, by means of a pump, it is raised, when wanted, for the pigs. Leaden keep the whey longer sweet than wooden vessels, and are much easier kept clean. This is done by scouring them with ashes of wood, and washing them well every time they are emptied, which is every thirty-six hours.

Tin vessels are used in preference to earthenware for holding the milk that is set for cream, and also for holding the cream. Those used for the cream hold about four gallons each, and are made with a lip for the convenience of shifting the cream from one of these vessels into another. This is done once every day during summer; and there is a wooden slice or knife always kept in the cream vessel, with which the cream is frequently stirred during the day, to prevent a skin from forming on the top of it, which is injurious to the quality of the butter. The skimming dish, used for taking the cream off the milk, differs from that used in cheese-making, being made of tin, with holes in it, to let the milk run out that may be taken up with the cream.

The butter-scales, prints, and butter-boards are of maple. The boards for making up the butter in half-pound rolls are about one foot long and nine inches wide. The barrel-churn is made of the best oak, and great attention is paid to its cleanliness. The butter-milk is never allowed to remain in it; but it is washed, scalded, and put up to dry, as soon as the butter is taken out.

Milking.—This is performed in three separate courts, to which the cows come from their several fields. The milkings should be as near as possible at equal divisions of the day, commencing at about four o'clock in the morning and three in the afternoon. To each milker eight cows are assigned, and one man carries the milk from all the milkers to the dairy. The milking should be finished in an hour. The dairy-maid sees that the milkers do their duty, and that all the cows are milked clean; for the milk that comes last is the richest; and, besides, if the cows are not clean milked, there will be a gradual diminution of the milk, perceptible daily: for these reasons the greatest care is taken that the cows are clean milked.

Cheese making.—The cheese-tub being put in its place in the dairy, the ladder is put across it, and a large thin canvass cloth covers the whole tub and ladder to catch any of the milk that may

drop from the pail, and to prevent dirt from falling into the tub. Above this and upon the ladder is placed the sieve, through which the milk is strained. If the milk should not be of the temperature of 85°, a portion of it is put into a deep tin, kept for the purpose, and placed in a furnace of hot water in the wash-house, by which the whole is warmed to a proper degree. It is of the utmost moment to attend to this; for if the milk is not warm enough when the rennet is put into it, the cheese will be "tender," and will bulge out in the edge, which spoils its appearance, and a great quantity of sediment of small curd will be found in the whey leads, which is so much curd lost. If, on the other hand, the milk is too warm, it will cause the cheese to "heave" or ferment, which injures both its appearance and quality.

When the milk is sufficiently warm, the coloring and the rennet are put into it. The coloring or anatto is put in by rubbing a cake of it on a plate amongst the milk until, from its appearance, it seems colored enough. One pound of anatto, at five shillings, is sufficient for half a ton of cheese.

The rennet being added immediately after the anatto is put in, the tub is covered with a woollen cloth for, at least, an hour. Rennet or runnet is made from the stomachs of calves, called here "vells." Irish vells are the best: they are cured, and sent to England, and sold by the grocers to the dairy-farmers. Mrs. Hayward never uses them till they are twelve months old, for, if they are not old, the rennet made from them causes the cheese to "heave," and to become full of "eyes" or holes. She prepares the rennet from them by adding to every six vells two gallons of brine and two lemons. The lemons do away with any disagreeable smell, and give the rennet sweetness and agreeable flavor. Twenty or thirty gallons of it are made at a time, as it is found to be much better, when made in large quantities. It should never be used, till it has stood for, at least, two months.

When the curd is sufficiently firm for breaking, it is gently and slowly cut with a three-bladed knife, down to the bottom of the tub, (the knife being about fourteen inches long,) both ways or at right angles, and around the sides of the tub. The cuts should be about an inch apart. When it has stood five or ten minutes to allow it to sink a little, and the whey to come out as clear as possible, some of the whey is dipped out of it with the bowl, and the curd is cut a second time with the three-bladed knife—very slowly to begin with; for, if the cutting is done hurriedly, a great sediment of very small curd will pass through the sieve and be found in the whey leads, and there will also be an increase of the quantity of whey butter which should have been in the cheese, and the value of the butter, thus obtained, will not compensate for the waste of curd, and for the loss of credit which the cheese will sustain from the abstraction of butter from it. The cutting being, therefore, performed very slowly at first, and with the strokes of the knife at a considerable distance from each other, is gradually quickened, and the strokes are taken nearer and nearer every time. At last, one hand, with the skimming dish, keeps the whole in motion, turning up the lumps suspended in the whey, while the other, with the knife, is in constant motion, cutting them as small as possible—and this operation is continued till no more lumps are brought to the surface, and the whole mass is reduced to one degree of fineness. This process may occupy a quarter of an hour.

The curd is now allowed to stand a quarter of an hour, and being, thus, sufficiently settled, the whey is taken from it with the bowl, and poured through a very fine hair sieve, placed over the whey leads. When the greatest part of the whey has been separated from it, the dairy-maid, folding over a portion of it, and beginning at one corner, goes around the tub, cutting the curd into lumps, and laying them on the principal mass, by which operation the mass is carried all around the tub, and most of the remaining whey escapes between the cut fragments, as they lie and press upon each other. From time to time the whey is taken from the tub, and put through the seive into the whey leads.

The curd is then put into vats, and pressed down with the hand. The vats, being covered with cheese-cloths, about one yard and a quarter long, of fine canvass, are placed in the press for half an hour, when they are taken out and the curd cut into slices, and put into a mill fixed on the top of the tub, which *tears* it into very small crumbs, as small as vetches. This mill, which is of Mr. Hayward's construction, is a great improvement in the making of cheese, not only as it saves the dairy-maid the most laborious part of the process, that of squeezing and rubbing the curd into small crumbs with her hands, but as it allows the fat to remain in the cheese, which the hands squeeze out.

In its pulverized state, it is customary with most dairy-maids to scald the curd with hot whey; but Mrs. Hayward considers cheese richer, when made without scalding the broken curd, this washing the fat out of it. She, therefore, without scalding it puts it into the vats, and presses it closely together with the hand, in filling them. In making double Gloucester cheeses, particular care is taken to press any remaining whey from the curd as the vats are being filled, and they are filled as compactly as can be done with the hand, being rounded up in the middle, but just so much so, as that the whole can be pressed into the vat. Cheese-cloths are then spread over the vats, and a little hot water is thrown over the cheese-cloths, which tends to harden the outside of the cheese and prevent it from cracking. The curd is now turned out of the vats into the cloths, and the vats being dipped into the whey to wash away any crumbs of curd that may cling to them, the curd, inverted and with the cloth around it, is again put into them. The cloths are then folded over and tucked in, and the vats, as they are filled, are put into the press one upon another. The bottoms of the vats are smooth and a little rounded, so as to answer the purpose of cheese-boards, which, therefore, are only wanted for the uppermost vats, or when the other vats are not quite full. The vats are allowed to remain under the press about two hours, when they are taken out and dry cloths are applied, which with double Gloucester cheese should be repeated some time in the day.

Salting and salting-presses.—The vats, when the clean cloths are given, as just mentioned, are changed from the single press to the one next to it, and placed in it, one upon another, as before. They remain in this press till the cheeses are salted, when those made in the evening take the

place, in the press, of those made in the morning, and those made in the evening are, in their turn, displaced by those made the following morning, the cheeses of the last making being always placed lowest in the press, and those of the other makings rising in it according to the priority of making. The same order is observed in the other two presses, the last or newest making in each being lowest, and each making having next above it that which was made last before it. The cheeses pass through the three presses in this order, advancing a step in their progress at each 'meal' or making, till, at last, in four or five days, they come out of the presses and are put upon the shelves. They are generally salted at the end of twenty-four hours after they are made, though this is done by some at the end of twelve hours. The salting should never be begun till the skin is all closed, for if there be any crack in the skin of the cheese at the time of salting, it will never close afterwards. The salting is performed by rubbing with the hand both the sides and the edge of the cheese with finely powdered salt. The cheese, after this, is retured to the vats, and put under the press, care being always taken, according to what has been said, to put the newest cheese lowest in the press, and the oldest uppermost. The salting is repeated three times with the single, and four times with the double Gloucester, twenty-four hours being allowed to intervene between each salting. After the second salting, the cheeses are returned to the vats without the cloths, that the marks of the cloth may be effaced, and the cheese may get a smoothness of surface and 'keenness of edge, which is a peculiarity of Gloucestershire cheese. The double Gloucester remain in the presses five days, and the single, four; but in damp weather they should remain longer. The quantity of salt generally used is about three pounds and a half to a cwt. of cheese.

The cheese room.—When the cheeses are taken from the salting presses, they are put on the shelf in the dairy for a day or two, where they are turned once in twelve hours. They are then taken to the cheese-loft to make way for the new ones. In the cheese-room, either on the floor or on the 'cheese-rack,' they are turned once every day; and, in general, in a month from the time they were taken out of the vat, they are ready for cleaning, which is done by scraping them with a common knife. The dairy-maid, in doing this, sits down on the floor, takes a cheese in her lap, and with the knife scrapes both sides and edge clean, taking off all scurf they may have contracted. The cheese, if intended for the London market, as is generally the case, when it has been thus cleaned, is rubbed all over with a paint made of Indian red, or of Spanish brown, or of a mixture of both, and small beer. It is rubbed on with a woollen cloth. After being painted, it is turned over twice a week, and oftener in damp weather; and, as soon as the state of the paint will permit, the edges of the cheese and about an inch of each side is rubbed hard with a cloth, at least once a week.

Characteristics of true Gloucester.—The marks of true Gloucester cheeses are,—'the blue coat,' which arises, through the paint on their sides, and which is a sure sign of their richness and sweetness,—the yellow, golden hue of their edges,—a smooth, close, and wax like texture,—a very mild and rich flavor,—not crumbling when cut into thin slices, nor parting, when toasted, with the oily matter they contain, but softening, without burning. If cheese has been soured in the making, either from being two long in hand, or from want of attention in scalding the utensils, nothing will cause it to assume the blue coat. If the curd is salted, when ground down before being put into the vats, the salt has the effect of giving a skin to each of the particles of the curd it comes in contact with, which prevents them from intimately uniting; and, although the curd may be pressed together and becomes good cheese, yet it never becomes a smooth, close, solid mass, like that with is salted after it is made, but is of a loose texture, and crumbles when cut; and although it may be equally fat, yet in toasting the fat melts out of it, and the cheesy part burns. The skin of the cheese, too, is not tough and solid, but hard and brittle, and when examined seems to be formed of many irregular portions, something like mosaic work.

Making of the butter.—The milk as it comes from the cows, is strained through a hair-sieve into the tin vessels, which are about four inches deep. It is allowed to stand only twelve hours, when the cream is taken off with the skimming-dish and put into the cream vessels, and the milk is warmed and carried to the cheese tub. The cream is shifted into fresh cream vessels once a day, and is also stirred frequently during the day with the wooden knife, that is always kept in each of the cream vessels. This continued shifting and stirring of the cream prevent a skin from forming on the top of it, which is injurious to the butter.

In summer or in hot weather, several gallons of cold water should be put into the churn, and allowed to remain an hour in it to cool the churn, before the cream is put into it. The cream is strained through a coarse canvass cloth kept exclusively for this purpose, and then put into the churn. The operation of churning should, in summer or in hot weather, be very slow, otherwise the butter will be very soft when taken out: but in winter or in cold weather, and particularly in frosty weather, the churn should be prepared for receiving the cream by putting hot water into it, and allowing it to remain for half an hour to heat the churn; and, then, the operation of churning should be performed quickly, and now and then the air, that escapes from the cream in churning, should be let out of the churn, or it will make the cream froth, and lengthen the process of churning very much.

When the butter is taken out of the churn, it is customary with most people to wash it with cold water before salting it. This is never done here, Mrs. Hayward having found from long experience, that butter retains its sweetness much longer when no water is used in making it up. When it is taken out of the churn, it is well worked with the hand, which presses out most of the milk; it is then beaten with a cloth, or rather, a cloth is repeatedly pressed down upon it, which absorbs all the remaining milk. When this is properly performed, and no trace of butter-milk remains, it is salted to the taste with finely powdered salt, which is well mixed with it by working it in with the hands. It is then weighed into half-pounds, and made up in rolls, about nine inches long. The process of making butter from the cream of whey is the same as that just described. Butter is made twice a week during summer.

The quantity of milk butter made on this farm,

is about 16 lbs. per cow, and that of whey butter about 25 lbs. per cow per annum. About 2½ lbs. of salt are used to a cwt. of butter.

Comparative estimate of the several applications of milk, viz., to the feeding of veal, and to the making of cheese and butter.

In feeding calves for the butcher, it generally takes seven weeks to feed them to about a cwt. each; and they consume the following quantity of milk in the seven weeks: About 10 gallons the first week; 16, the second; 20, the third; 24, the fourth; 27, the fifth; 30, the sixth; and 32, the seventh; so that, it takes 159, or say 160 gallons of milk to produce 112 lbs. of veal. The average money value of the above modes of converting milk into a marketable commodity will stand thus:—

100 gallons of milk produce 112 lbs. of cheese of the best quality, which at 6*d.* per lb. is - - - -	£2	16	0		
And 5 lbs. of whey butter, which at 8*d.* per lb. is - -	0	3	4		
Value of 100 gallons of milk, when converted into cheese ———				£2	19 4
100 gallons produce of milk butter 34 lbs. which at 10*d.* per lb. is - - - -	£1	8	4		
And of cheese of the worst quality 74 lbs., which at 3*d.* per lb., is - - - -	0	18	6		
Value of 100 gallons, when made into butter - - ———				£2	6 10
160 gallons produce 112 lbs. of veal, which at 7½*d.* per lb., is	£3	10	0		
But calves, when dropped, generally sell at 10*s.* each, which being deducted -	0	10	0		
Leaves, as the value of 160 gallons, and therefore the value of 100 gallons in feeding veal - - - -	£3	0	0	1	17 6

Thus, making cheese of the first quality is more profitable than either making milk-butter or feeding veal; yet many farmers continue to feed calves during the early part of the spring—a practice not justified by an examination of results, but persevered in from habit, as many practices are, where active pursuits are not conjoined with a spirit of inquiry and comparison.

From the Farmers' Cabinet.

ANTI-LIME.

Mr. Editor—Being informed by a neighbor, that you offer to publish experiments made in agriculture, for the information of your readers, I take the liberty to send you an account of the following, which I made last summer, to test the relative value of the several different manures in raising corn. I selected five acres of worn out land, in one piece, and of a quality as much alike as possible, and ploughed it flat, some time in April. On one of these I spread one hundred and fifty bushels of marl, procured from Woodstown, in this county; on another, one hundred bushels of drawn ashes; on the third fifty bushels of fresh slacked lime; and on the fourth, forty bushels of bone dust, so called—that is, bones ground, say three parts into small fragments, and one part into a coarse dust or powder—which I procured at a button factory in the neighborhood of Bridgeton. The fifth acre I left without manure of any kind, in order to test the actual value of the different manures used on the other four acres. Cost of the manures was as follows: the marl, which I hauled about ten miles, I put down at ten cents per bushel, including the carting, that is, fifteen dollars for the first acre; ashes, ten cents per bushel, or ten dollars for the manure of the second acre; lime, sixteen cents per bushel, including the cost of hauling, will make eight dollars for the third acre; and bone dust, for which I paid forty cents per bushel, to which add four cents per bushel for hauling, makes seventeen dollars sixty cents for manure used on the fourth acre. The cultivation of the whole five acres was the same; and the result of the crop taken and measured, from each acre, was as follows:

Bone dust produced twenty-six bushels; ashes, twenty-four bushels; marl twenty-two bushels; lime only six bushels; and the unmanured acre *six bushels also.*

Much has been written in favor of lime. As far as my experience goes, and I have tried it on several occasions, I have never found any, or but very little benefit from it the first season: but in two or three years, it will generally produce a very sensible increase on some of the crops following, especially on oats and on clover. I do not therefore consider lime as the poor man's friend; though in those parts of the country where ashes, marl, or bone dust, are not to be readily procured, I should recommend its use.

ABBOTT ATKINSON.

Pittsgrove, Salem county, N. J.
Feb. 10, 1840.

From the Providence Courier.

A FARMER'S LIFE AND DUTIES.

If we were ever envious, it was of the farmer—the intelligent, independent farmer, who owned his land, his house and barns; who was free from debt, whose family were growing up prosperously around him, upon whom God smiled and blessed. We have seen such a farmer; and in truth, we know of no man so happy, and no business so permanently profitable—none that makes the owner so independent. An independent farmer has his house to live in—it is his own—he has earned it by the labor of his hands. He has his granaries filled with the production of his farm, his barns with the stock reared, and the hay raised upon his farm. His cellars are filled with the necessaries and comforts of life. Almost every thing necessary to feed him and his family, grows around him. He may raise his own pork, fatten and kill his own sheep, eat his own poultry and his own eggs—live upon his own home-made bread—weave his own cloth—raise his own wool—knit his own stockings, through the agency of his wife and daughters—make his own butter and cheese; in short, live and dress comfortably, with-

out going off his own homestead. This is no fiction; and it is a fact, that the farmer is the most independent man in the community.

But in order to be happy, and make his life useful as it ought to be, he must be intelligent—in possession of the means of knowledge—especially that kind of knowledge which relates to his own profession. He must use the means which God has given him, to be happy himself, and to contribute to the happiness and comfort of those around him. In justice to himself he will employ his evenings in the acquisition of knowledge. He will be a reader of useful books, and a supporter of the public press, which brings to his door the newspaper which gives him the history of the world. Such a farmer as this will fulfil his duties to his God, and his fellow-man, and is the happiest and most independent among the best of men.

MR. JACOB SHEIMER'S SYSTEM OF FARMING.

From the Genesee Farmer.

Notes of a conversation had with Jacob Sheimer, Esq., a German farmer, of great skill, who resides in Saucon township, Northampton county, Pa. He ranks high as a practical farmer in a place which has been long celebrated for its fine farms, and good farmers. He says that his farm contains just one hundred acres of farm land, which is divided into eight equal fields, excepting four acres which is allowed for house, barns, garden, &c. One field is in with corn, three with wheat, and one with rye, and three for mowing, pasture, &c.

He breaks up his corn stalk ground for wheat the last of May, and immediately harrows it well, and then furrows it out into eight pace lands for lime, a half bushel at each corner, when the stable manure is put on. It is ploughed a second time before harvest; immediately after harvest cross and harrow well, and then sow about the 28th of September with one bushel and a half of clean wheat per acre, to be ploughed in with a one horse plough very shallow, and then harrowed.

The next spring sow with clover seed at the rate of one bushel to eight acres. The following year to be mowed, and immediately after mowing, strike one furrow across the field and back again every forty-five feet; turn no cattle in, but when the second crop is large enough, plough it neatly down. If necessary run a harrow over before ploughing; two weeks after let it be well harrowed, and about the 28th of September sow with wheat as before.

Next spring sow with clover seed for pasture until after harvest the following year; then turn it carefully down, harrow it well, and sow as before.

The following year sow no clover seed, but plough the stubble down immediately after harvest, harrow it well, and sow one bushel of clean rye per acre, and plough in.

After the rye is cut off, leave it until the following year when it is to be planted with Indian corn, three and a half feet apart and four grains in a hill, to be plastered in the usual way, and plough well three times.

Mr. Sheimer says that his three crops of wheat are always the best, and he also says he has not missed a crop in thirty years, and that he raises from ten to twelve hundred bushels of wheat every year.

The thrashing must be finished by the first of March, and the stable dung must be spread over the yard at least once a week; this is all he does to prepare it for hauling out the latter part of June.

You will perceive that his is an eight year course, and that he has one year summer fallow. A practice now prevails in that section, of sowing clover seed among the corn after the last ploughing, and some skilful farmers say they have had good success with it.

No. 1.	No. 2.	No. 3.	No. 4.
Corn,	Fallow,	Wheat,	Clover,
Fallow,	Wheat,	Clover,	Wheat,
Wheat,	Clover,	Wheat,	Clover,
Clover,	Wheat,	Clover,	Wheat,
Wheat,	Clover,	Wheat,	Rye,
Clover,	Wheat,	Rye,	Corn,
Wheat,	Rye,	Corn,	Fallow,
Rye,	Corn,	Fallow,	Wheat,

No. 5.	No. 6.	No. 7.	No. 8.
Wheat,	Clover,	Wheat,	Rye,
Clover,	Wheat,	Rye,	Corn,
Wheat,	Rye,	Corn,	Fallow,
Rye,	Corn,	Fallow,	Wheat,
Corn,	Fallow,	Wheat,	Clover,
Fallow,	Wheat,	Clover,	Wheat,
Wheat,	Clover,	Wheat,	Clover,
Clover,	Wheat,	Clover,	Wheat.

OLD NORTHAMPTON.

SWAMP MUD FOR MANURE.

From the New England Farmer.

Mr. Fessenden—In my last note to you I promised to give some further account respecting the decayed vegetable matter, generally called swamp muck, which many sections of our country abound with. The use of which, applied on an upland loam, gravel, or sandy soil will pay the expense of labor in removing it, two for one the first year, as the statement of facts hereafter annexed, fully proves.

The last fall I carted several loads of muck on to a knoll of loam, and put it in one heap, though I think it would have been better to have dropped one load only in a place. In the spring, prior to planting corn, the muck was spread and ploughed under. The crop of corn where the muck was spread, was large. I thought larger than where barn yard manure was put. A neighboring farmer has made use of muck for several years. The first year he thought it equal to barn yard manure, and its effects were perceivable a much longer time. The soil on which the muck was put, was a warm gravelly loam. The muck was used by another neighboring farmer, for manuring corn in the hill, which was used in the following manner: A row of each alternately, one of barn yard manure, and one of hog manure. He assured me the corn was much the best manured with the muck. The soil a sandy loam.

Mr. Daniel Bloomer when residing in North Salem, West Chester county, in the year 1796 had four acres of gravelly loam of equal quality which he planted with corn. Prior to planting the corn, he applied fifty loads of muck per acre, on

two acres; these two acres produced him one hundred and twenty bushels; the other two acres yielded only sixty bushels. The next spring these four acres were sowed with oats and grass seed. The oats was more than twice as large on the two acres dressed with muck as they were on the other two. The grass for the four succeeding years produced in much the same ratio. I might relate other improvements of a similar kind. It is presumed that every intelligent, industrious farmer will be satisfied of the utility of muck as manure. Those farms which are interspersed with swamps of muck and uplands either of loam, sand, or gravel, may be made, at an expense of five to ten dollars per acre, capable of paying an interest annually of one hundred dollars. Ten dollars expended with economy will, in most circumstances, be sufficient to cart and spread one hundred loads of swamp manure on an acre.

Those who are owning farms, situated as just stated, now valued at twenty-five dollars per acre, have only to say the word, and go forward, for one or two years, to convince themselves and their neighbors they have farms intrinsically worth one hundred dollars per acre. Why so? it may be asked. Because they will pay a net profit over and above all expense, amounting to the interest of one hundred dollars. Look for a moment at the statement of Mr. Bloomer. He tells you he applied fifty loads of muck in the spring, (though the fall is a better time, and the muck is better to be laid on lands in the fall,) per acre, which cost him five dollars. On this acre he had an excess of corn of thirty bushels, at fifty cents per bushel, which would leave ten dollars, nearly, to pay the interest of one hundred and fifty dollars at 7 per cent., and this only for the first year. It is worthy to consider, by taking the muck from the low lands, that ditches may be made or improved, so that the low lands may produce bountiful crops of timothy and red top, &c. &c. It is desirable that farmers in different parts of the country would try the utility of the muck on the different summer crops, and inform the public of the results of their labor through your useful New England Farmer, all of which are highly beneficial to us farmers.

HUSSEY'S REAPING MACHINE.

From the Baltimore Patriot.

Mr. Charles Carroll, of Doughoregan Manor, having fully tested the advantages of this reaping machine, during the late harvest, speaks in very decided terms as to its merits. Mr. Carroll has had upwards of one hundred acres of grain cut with this machine, "on all kinds of ground, not too stony, and in light and heavy wheat;" and in a communication to the Chronicle, he gives it as his opinion that it is impossible for cradles to cut grain as clean or as evenly, for it takes every head and leaves the stubble accurately level. In very heavy grain, however, the machine is represented as showing to most advantage—performing in such grace, the work of four cradlers, and furnishing employment for eight good active binders. The machine is drawn by two horses, which in constant or heavy work should be changed twice a day. This machine is evidently a valuable invention, or improvement in the matter of harvesting; and Mr. Carroll observes that it may be applied to cutting of clover seed; and with some alterations to the cutting of meadows and all kinds of grass. As to its allotted use as a "reaper," he thinks it will soon be seen upon all farms where it is found necessary to have a thrashing machine.

USEFULNESS OF BIRDS AND TOADS.

From the Boston Courier.

Mr. Editor--I see it stated in your paper of Friday, that the probable reason why the canker-worm commits small ravages in 'Flob,' is found in the care with which the birds are protected. I was reminded of a remark in Peabody's Life of Wilson. "He enters into a deliberate calculation of the value of the services of the red-winged blackbird, which certainly bears no good reputation on the farm; showing that, allowing a single bird fifty insects in a day, which would be short allowance, a single pair would consume 12,000 in four months: and if there are a million of pairs of these birds in the United States, the amount of insects is less by twelve thousand millions, than if the red-wing were exterminated." Let any one, during the brooding season of robins or other birds, rise by break of day and count the number of times old ones return in one hour with worms and insects, or, if he can, let him count through the day, and the number will be found almost incredible.

The practice of killing birds for mere amusement, is not merely indicative of cruelty and want of feeling, but is exceedingly detrimental to the interests of the community. If the farmers reflected and made calculations upon the subject, they would discourage and oppose it as one of the greatest scourges, and would pay a premium to their boys to let the birds alone, rather than furnish them with powder and shot to kill them.

And, now that I am upon the subject of insects and worms, let me add, that there is a very unreasonable prejudice against toads. They are exceedingly valuable in gardens, and other places, in consequence of the exterminating warfare they are continually waging against the bugs and worms. Any person who has them in his garden has a treasure there; and if he will watch them closely, he will find them accomplishing more in the way of preserving his squash and cucumber vines, and other vegetables, than he can do with all his troughs of liquid. I think these subjects will be brought more fully into notice by the gentlemen commissioned by the state to examine into its natural history; indeed I know that one of them, at least, has been at great pains for two years, to collect from all parts of the country what information he could upon the subject, which would be likely to secure the farmer from the ravages which his trees, his grain crops, and all the products of his farm suffer from insects and other causes. I would suggest that this subject be brought up at the weekly agricultural meetings, and that persons acquainted with these matters be invited to communicate their information upon them. For, notwithstanding all the outcry about retrenchment, and useless offices, it seems to me that no offices in the end are likely to be more valuable to us, than those which will bring to light the hidden resources of this state, and collect all

the information, both scientific and practical, which will secure to the agricultural population relief from every thing which blights and diminishes their crops. S. Y.

GRAPE CULTURE.

From the Franklin Farmer.

Every bunch of grapes, according to Knight, in the Hort. Trans., commences its formation as a tendril, and it is always in the power of the cultivator, to cause it to remain a tendril. The blossoms are all additions, the formation of which is all dependent upon agents, viz., upon the leaves, which are required to elaborate the food, and upon a good exposure to light and heat. Hence the importance of pruning in autumn or spring, to thin and shorten the wood; and in summer, to increase the exposure of the fruit to atmospheric influence. This practice is too much neglected, or too sparingly performed, by novices in the grape culture. It is essential to native as well as to foreign varieties. It is too common a practice to train the Isabella and other native kinds on arbors, and to let the wood accumulate as it will without using the knife, or using it sparingly. The consequence is, that the fruit is lessened, from want of exposure, its time of ripening retarded, and its quality sensibly impaired. One of the most extensive cultivators of the native grape, Mr. E. H. Bonsall, of Germantown, Pa., says, that it is his practice, even after the vines have attained a full capacity for production —say five years from the cutting, to cut them in low—his object is to prepare them for bearing an average of fifty clusters to each, leaving several shoots, *from three to five joints to a vine* for this purpose; and that when fresh pruned, they will not be more than four feet high at the greatest age. We saw Mr. Bonsall's vineyard, consisting of some acres, in the summer of 1833, and it had a remarkably fine appearance.

In the summer pruning of the grape, let these rules be observed: 1. Suffer only one shoot, and let that be the strongest, to grow from each joint: and if these are very near each other pinch off every other one. 2. When the fruit has set, which will always be upon the new growth of wood, and generally on lateral branches, shorten the fruit-bearing laterals to three or four eyes above the fruit, and the laterals not bearing fruit to one eye from the main vine. The object of the first is to throw the sap into the fruit, instead of permitting it to become exhausted in the formation of new wood; of the second, to preserve the bud at the base of the lateral, which is the fruit bud of the following year; and both to prevent the too great accumulation of wood and foliage. The main vines may soon after be shortened. The extreme buds on the main vines, and generally on the laterals, will generally burst, and throw out a new growth. These may also be occasionally shortened, without injury to the vine or fruit. When the fruit has obtained its growth the process of ripening may be facilitated by thinning the foliage about the fruit, so as to give it a better exposure to the sun and air.

In winter pruning, the laterals may be cut in the main vines, taking care not to injure the buds at their base, and the main vines may be shortened to the required length of two to six feet.

Mr. Bonsall's mode of training his vines deserves notice as well for its cheapness as for its utility—of this we speak from experience. He sets chestnut posts, at the distance of ten feet, firmly in the ground, on the line of his rows. He drives into the face of these at regular intervals, three (we prefer four) stout nails, nearly up to the head. He then stretches wire, of the size denominated No. 11, along the whole line, making it fast at the end, and giving it a turn round the nail in every post. The posts stand five feet above the ground; the first wire is two and a half feet from the ground, the second intermediate between that and the top of the post, and the third at the top. To these wires the tendrils readily clasp, and much labor is saved in tying, while the wires do not intercept the sun from the fruit and foliage. Tinned wire, though it cost more, is preferable to the common sort, as it is far less liable to corrode. Mr. Bonsall plants his rows seven feet apart, and at the distance of four feet in rows. It should be borne in mind, that the richest grounds do not suit the grape so well as those of moderate fertility—as the former produce a superabundance of wood, and fruit of inferior quality.

MANURES.

From the Genesee Farmer.

Almost every distinguished farmer has had some hobby, some favorite method of cultivation, some panacea for all the evils of poor soils and worse cultivation, to the adoption of which all other things are made subservient. Thus, Tull thought of pulverization alone; Cooke's system is drilling and weeding; Lord Dundonal's is draining; Bakewell, in improving cattle and sheep had reference only to size and propensity to fatten; he used to say, he did not care whether there was any wool on his sheep or not; Frederick, Elector of Saxony, went for the wool alone, and the flocks he produced are without a rival. With us, the hobby of some lies in the rotation of crops; some have unlimited faith in renovating soils, by alternating wheat and clover; while others place their dependence on roots. But it may be remarked, that while all other hobbies may occasionally be ridden too hard, the man who directs a considerable part of his time, and his spare capital, to the preparation and use of manures, will have no occasion to regret the expenditure; for it may be put down as a truth in agriculture, that the character of a farm, and the farmer, may be pretty accurately known, by the quantity of manure prepared and used upon the premises.

There are few things in which American agriculturists exhibit a greater want of forethought and good husbandry, than in the general neglect of the means they possess for retaining or increasing the fertility of their soils. Animal manure is, in all cultivated countries, the great agent for promoting fertility, and for replacing those ingredients in the soil essential to vegetation, but which are gradually exhausted by cropping. Whatever opinion we may form of the philosophical theories of the present day, on the subject of nutrition in plants, the fact that animal manure increases fertility is doubted by none, and it is the practice and not the theory with which the farmer should

be most interested. Now, as ever, the stable and the barn yard are the places to which the farmer looks for his supply of manure; and it is to these points that his attention should be directed, when wishing to increase the quantity and the value of this essential article.

One of the greatest losses the farmer sustains, is by allowing the urine of his stables, and the wash of yards to run to waste. Urine, as is now well known, is one of the most active fertilizing agents, and the leachings in the yard contains a very large proportion of the salts that accumulate in such a depository. How often do we see the drainings of the yard and stables, black with decomposed matter, and rich with the most fertilizing of salts, pass off into the highway, or some streams, as though the owner considered them a nuisance of which he was glad to be rid in the best way he could. There are two ways in which this egregious waste may be prevented, and these most essential parts of animal manure saved for the use of the farm. The first and the best way, where the yard will admit of it, is to cover the yard with such a quantity of vegetable earth, turfs, swamp muck, wash of the roads, or any light absorbent earth, as to retain the urine and moisture of the manure, and prevent its escape. Where, from the quantity of the manure, or other causes, this drain cannot in this way be prevented, a large vat, or what is still cheaper, a simple excavation may be made in the earth, and the drain conducted into that. If the earth of the pit is too absorbent it may be clayed; but unless it is very porous, it will soon cease to absorb the fluid conducted into it. The reservoir should never be allowed to overflow, but when filled should be taken out, and by means of a cheap apparatus drawn by oxen, distributed over the surface of grass lands, or those intended for crops.

But we hear some one objecting, that all this may be well enough, but it will cost a good deal, and take much hard work to cart this earth to the yards, or distribute the contents of the reservoir. So it will; and what permanent benefit is acquired that does not cost the farmer hard work. The only question is, whether the work is profitably expended; if so, the more work there is done on a farm the better. If a farmer by employing one man for six months of the year, in converting the manure of his yards into compost, by placing in it a few hundred loads of earth, turf, muck, &c. to absorb the moisture of the yard, and be thoroughly mixed by the feet of cattle during the winter, or in distributing daily the proceeds of the reservoir, should only add enough to the proceeds of the farm to pay his man so employed, he might consider the work done as the most profitably expended of any on his farm, since the benefits are not confined to a single year, or crop, but to many successive ones. There is not capital enough in the shape of labor, usually employed on our farms; and we doubt not, there are many farmers who complain they are losing money by hiring one man, would make money by hiring two. Not, indeed, unless the capital or labor was well directed, and the same may be said of capital employed in any other way.

Farmers in general have little idea of the improvement that might be made in this respect, or the amount of their available means in the matter of manures. There are many farmers in the country who think they do wonders if they use one hundred and fifty or two hundred loads of manure annually, when they could, and should, if they would consult their own interests, use five hundred or one thousand in the same time. It does not require a large stock to give five hundred loads of compost or manure to the farm, if business is managed right. A single example in proof must suffice, though hundreds might be adduced. Mr. Wm. Clark, Jr. of Northampton, Mass., "keeps an average stock of eight swine, three horses, and eight oxen and cows, and from this stock he made from June 1837 to June 1838, nine hundred and twenty loads of first rate manure, as his excellent crops most abundantly testified. Mr. Clark used for compost three hundred loads of sods, and two hundred and forty-seven loads of swamp muck. His yards were supplied with corn-stalks and refuse hay during the winter, and brakes and weeds during the summer, and cleared out twice during the year."

It is an honor to a man to labor when his efforts are calculated to insure success; but to labor hard when working tends to no profitable results, betrays a want of that forethought and intelligence which should characterize the American farmer.

TO SAVE SEEDS.

From the Southern Agriculturist.

All seeds keep better in their seed vessels, but this can rarely be done, on account of the great space occupied. As soon, therefore, as the pods of cabbages, turnips, radishes, &c., turn brown, and a part become dry, the stems should be cut and laid on a cloth or floor to dry, and afterwards threshed out, and hung up in bags in some open airy place. Lettuces should be pulled up with the roots, as soon as there is the least appearance of maturity, and hung up, and the plants will ripen all of their seeds, nearly at the same time. If left in the garden to ripen, the earliest and best will be lost; in fact, except under very favorable circumstances very few will be obtained, as every shower and every strong breeze will lessen the quantity, and scatter those which are matured over the whole garden. The same course should be pursued with leeks and onions. It is a prevalent opinion that the bush squash cannot be perpetuated among us, as such have a strong tendency to run, and will in one or two seasons become a vine. This is a mistake, and originated, no doubt, in the manner of saving the seed. If the first squashes which appear be retained for seed, there is no danger of the plant running the next season; but if these be used, and those which are borne at the extremities are preserved for this purpose, they will run, and moreover will be later in bearing. To have early fruit of either the squash, cucumber or melon, the very first should be reserved.

From the New Genesee Farmer.

THE ROOT CULTURE.

* * I will now give some account of my own experiments in the root culture. In the first place,

I have become fully convinced of the necessity of having the land free from grass and weeds. In 1838 I sowed about an acre of ruta baga, on good sandy loam soil, somewhat infested with June grass. The land was well prepared, but the weather being moist, the grass was not killed, and it soon sprang up very thickly. This rendered the after culture very difficult and vexatious; and, with all my patient and persevering efforts, I found it impossible wholly to subdue the June grass, and I fully coincide with friend Garbutt in the belief that it would be well for western New York if this grass could be entirely exterminated. From my sad experience with this grassy patch, I became fully determined never to be caught in this same way again.

I last year selected a clean piece of land for my ruta baga crop; ploughed in a dressing of good manure; ploughed it shallow the second time and harrowed it smooth. I then took a light plough and made ridges, about two feet apart. I had no drill-barrow, but took a common wheel-barrow and rolled it along on the top of the ridges, so as to make a small furrow or drill, into which the seeds were sown by hand. A third person followed with a rake, so as to cover the seed, and leave the top of the ridges smooth.

I prepared my seed by putting it into a basin and mixing with it about half a pound of sulphur; because I had read, either in the Farmer or in the Cultivator, a recommendation of sulphur to be used in this way, for the purpose of fixing its flavor in the seed to keep off the fly.

The seed soon sprang up. The turnips were not injured by the fly; and whether it was the sulphur which prevented the depredations of the fly, I know not. The season was not dry, and therefore unfavorable to the propagation of the turnip fly. I thinned the plants to ten or twelve inches apart. They grew rapidly and flourished through the whole season. They were hoed thoroughly twice. They were harvested towards the last of October, and deposited in trenches three feet deep and four wide, and the turnips were raised about a foot above the surface of the earth. However, before putting the turnips into the trench, I put crotches into the middle of the trench, about eight feet apart, and rising above the surface eighteen inches. I laid a ridge pole on the top of these crotches for the purpose of forming a roof, of small sticks, brush and straw, and lastly earth. The roots being stored in this manner, a boy can enter the trench with his basket at any time in the depth of winter, and is never exposed to the inconvenience of a falling roof. Precautionary steps against their heating are always to be taken, by leaving small apertures for the escape of heat and admission of air.

After having produced and stored your crop of ruta baga, what use do you make of them? Hogs that are three or four months old and upwards, will live well on them; but if they are younger, they ought not to be confined exclusively to them. Cooking them renders them much more nutritious for hogs and pigs. They are excellent for cattle and sheep of every age. When sheep are confined for a few weeks in the yard for winter, they pine to be grazing in the field unless they are fed on roots; but when permitted to enjoy this food, they have not half so much hankering for the field.

I will take the liberty of mentioning one thing, among many others, which may be of considerable use to the inexperienced; and that is, it is of no use to cut up the turnips small and fine for the sheep. Scatter them over the ground or hard snow, and then follow with the shovel and slice them a few times each, for sheep delight much in gnawing the turnip. For two winters I was in the habit of cutting my turnips into small pieces, not larger than a hickory-nut, for my sheep. I have since found this to be entirely unnecessary.

I will furthermore add, for the benefit of the inexperienced, not to dig trenches for the reception of roots where they will be exposed to be filled in with water, when the snow melts, and the earth is filled with water,

One corner of my ground was considerably inclined to clay, and here the turnips were quite small. That kind of soil is wholly unfit for them.

Chili, March 15th, 1840. P.

DISORDERS OF THE CURRENCY, AND THE REMEDY.

[The following article has more of truth and good sense in it, than twenty wagon loads of the ordinary elaborate newspaper essays and speeches in our legislative bodies, on banking and the disorders of the currency. We concur fully with the writer in his general views of the causes of the enormous evils in connexion with these important subjects; and we do not differ greatly as to the proper and sufficient remedy. For we are as decidedly in favor of *free banking*, as of freedom to every other legitimate and useful branch of industry and trade. It is, however, to the *proper and legitimate* objects of the useful trade of banking and dealing in money that we would give perfect freedom, and afford, equally and justly, every facility to operate that every other business has, or ought to have; but we would by no means add to that freedom the grant of any *exclusive privilege;* and certainly not the all-important one of *coining money* out of paper, to an unlimited extent, and thereby furnishing to the country its exclusive and sole currency. Half the cost of legislation of the country is directly or indirectly incurred for the regulation of banking; and yet, in regard to banking, government (state and federal) has done nothing but sin, both in doing what ought not to be done, and also in omitting what ought to have been done. They have granted exclusive privileges, which never ought to be granted to any bodies or individuals; and they have withheld that proper freedom of action, which all trades ought fully to enjoy.—Ed. F. R.]

From the Journal of Commerce.

The discussion about a national bank has died away, and the opinion has become almost universal that such an institution will never again

exist in our country. A very large proportion of the merchants who, a few years ago, were the thorough-going advocates of a national bank, have, after witnessing the mischiefs incident to putting down the late bank, come to the conclusion either that such an institution is not desirable in itself, or if it is, that it must be so dependent upon politics and parties, that another would very likely be overthrown as the two heretofore established have been, and that the convulsion is on the whole, or the danger of it, more to be dreaded than all the benefits of the policy are to be desired. At the same time, there is a very general feeling that our present system of banks is deficient and insecure without some central power to bind it together and produce uniformity of action. Multitudes say "we must have something." But no general sentiment can be obtained in favor of any plan. The various states have expended more legislation on banks and the currency than upon any thing else, and yet there is nothing about which there is so general a feeling that the desideratum has not yet been reached. After all the variety of laws, and systems, and amendments, which have been devised, the impression is as extensive as ever that the arrangements are inadequate to the exigencies of the case. A regulator is wanted.

In Europe, the same state of feeling exists as here. The Bank of England is an object of constant attack. Its movements are watched with intense and dissatisfied interest. Its peculiar privileges have been, and will be still farther diminished. Rivals are rising up who with less responsibility dare talk of defying its power, and the public mind is always deficient of confidence in the wisdom of the bank or its ability to accomplish the object of its creation. It is evident that in England, as well as here, the banking system as it exists does not possess the degree of confidence which enables the public to repose upon it. There is very generally the feeling, that the system is not so good as it might be; that there must be somewhere, among things yet undiscovered, a better way.

It seems strange that this matter cannot be put in a satisfactory shape. The products of the world are brought together, manufactured and distributed, and all the movements of actual goods and chattels carried on by a system which never fails to operate, and to operate in such a way that the whole commercial world are satisfied that nothing better could be devised. The million and a half bales of our cotton are collected together in the seaports, sent forward to the eastern states, to Europe, and wherever else any portion of it may be wanted; the whole quantity is manufactured into numberless articles of comfort and elegance, and returned through the ten thousand channels of consumption, and the whole world is satisfied. So with our mighty crop of bread stuffs. So with all the commodities of the world. Ships are built of the right sizes, and in suitable numbers, and so it is with brigs, schooners, sloops, and boats, steamers, wagons and carts. There is no difficulty about regulating the exchanges of cotton, or flour, or iron, so that the difference in price between the article at one point and another is always kept as small as possible. Wherever there are products to export there are ships ready to carry them away, and bring back other things in exchange. In all this mighty movement about the exchanging of commodities, there is scarcely a bale of cotton, or a barrel of flour or chest of merchandise, of any sort to be transported a rod, a mile, or ten thousand miles, but there is ready at hand the appropriate carriage to accomplish the design. It is quite certain that all this machinery cannot be made to operate thus by chance, for then all the ships of the world would sometimes assemble in the Gulf of Mexico, and at others in the East Indies. There must be somewhere a great regulator, or such perfect adjustment between demand and supply could not possibly exist. It would be as ridiculous to suppose that all this is done without laws, as to suppose that the sun keeps its centre of the solar system, and all the other bodies theirs, without laws. The laws which work so admirably, must be good laws, and wisely framed. They are not, however, to be found in any of the great tomes in our law libraries. It strikes us as very strange that the whole system which transports all the masses of merchandise, should work so well, and yet that the comparatively little affair of keeping the accounts should make so much trouble and be so difficult, nay almost impossible, to fix in any satisfactory shape. How is it, that a cargo of cotton can be shipped from New Orleans to New York without the least difficulty, and in a manner perfectly satisfactory to all concerned, and yet that the bills of exchange, the mere bits of paper by which the proceeds are reckoned and transferred, can find no satisfactory method by which they can be treated. What is the grand superiority of the system which regulates ships, steamboats, and wagons, and their cargoes? We will tell thee, reader, the secret of the whole matter. It is free.

We wonder that the dangers of a free system of navigation have not attracted the notice of our legislators from the beginning to this day. If government did not see to it, how could it be expected that the vehicles, infinite in variety as well as number, could be provided to transport our immense quantities of merchandise? How could we expect that ships and smaller vessels, steamboats and horse carts, should be every where ready at a moment's notice, unless government should make provision? Again, how dangerous it must have appeared to allow Tom, Dick and Harry, to set up as shippers, wagoners, and carters. Was it not quite apparent, that if irresponsible persons were allowed to go into freighting business, incompetent and fraudulent men would load their ships on freight, and then run off with the goods. What immense frauds, what boundless ruin, must ensue if every body could own ships and freight goods. Thanks to Providence, our legislators have never fallen into these frightful contemplations, for had they, the consequence would no doubt have been, that in the discharge of the first of their duties, they would have passed an act forbidding any man, or body of men, to own, charter or possess any ship or vessel, on pain of the penitentiary. They would no doubt have felt an especial horror of those little boats, shallops and smacks, which so inflate the shipping business, disorganize freights, cause revulsion in the crops, and cheat the poor. Having created a great chasm on the ocean, and perfected the mischiefs they feared, it would of course have been necessary that some provision should be made for the transportation of goods. If the several state

legislatures had then set themselves to create corporations with power to own ships and vessels, steamers, wagons and carts, and to use the same, each company to be under the management of a president and board of directors, until the number of companies had been multiplied to one thousand, and if congress would then have perfected the system by the establishment of one great national freighting company, with a capital of thirty-five hundred ships; if to ensure the accurate working of the system, each state had established a board of commissioners of freighting, and carefully forbidden any company from sending out more than a fixed number of ships, and hampered and clogged the business by forbidding any company ever to take a higher rate of freight than ten cents a cubit foot, whether the voyage be hazardous or safe, ships plenty or scarce—if all this, and ten thousand other provisions, had been established by law, we might have had abundant reason to be satisfied, perhaps, for we should have been fixed about freights, just as we now are about money, and any man who had ten bales of cotton to ship would probably be able to get an answer to his proposition at the semi-weekly meeting of the board of directors, provided he put it in the day beforehand. In our judgment the comparison we have here drawn, is perfectly just and appropriate; and a system such as we have drawn, would be just as well suited to freighting as it is to currency. But who does not turn away from such a system of freighting with contempt? who would not quit business, almost, if he must encounter such a system? What revulsions would it not produce in the rates of freights; and how certain it would be to make the rates on an average twice what they are now. Who would not scorn the folly, idiotic stupidity, of a people who should set about the creation of such a system. What folly above all other folly would it not be, for a people after setting up such a system, to fall upon the work of their own hands with reproaches, to attack the shipping companies as monopolists, and try to make political capital by creating odium against them. Nothing can be plainer, than that the people should blame themselves and no body else, for the bad working of their own bad systems. If, however, such a system were now in full operation in freighting, it might be wise to sustain it. Certainly it would be unwise to break it down suddenly, for the distress growing out of a sudden revolution would be very great. But if it should become broken down, then we think most obviously, the true system should be with all convenient despatch adopted.

And now, with all deference to the opinions of the wise and prudent, we are ready to propose what we have no doubt is a true remedy for the evils of our currency; a remedy which will make our system as perfect as any earthly system can be. It is not that the charters of the banks should be taken away, or any damage or odium upon them. Our banks have done their duty to the country as well as they could; or, at least, as well as was to have been expected. They deserve well of the people. Let them live for ever and prosper. The evils of the banks belong to the system which the people have made; a system which in its nature renders it impossible for the banks to sustain a staple and steady currency. The remedy is the repeal of all prohibitory laws on the subject of banking and the use of money. Instead of the responsibility of furnishing a currency remaining on our legislators, let them leave the whole matter to the people. If the people cannot contrive ways to keep their accounts, let them guess it out. Let the confused notion about the creation of money being an act of sovereignty, be sent back to Europe where it belongs. Congress having established a standard yard, a standard pound, a standard gallon, and a standard dollar, will have accomplished all the ends of government. In respect to money there is a peculiarity, however, merely physical. The standard pound may be placed in the hands of a public officer in each city, and all the weights of the city may be brought to him, and he can presently adjust them. Not so in money exactly, because it is easier to coin money, than to "seal" it after it is coined. So the easiest way with regard to it will always be for every man to take his bullion to the mint, and let it there be coined. The only useful end accomplished by government in all these matters, is the same throughout, viz.: the establishment and maintenance of uniformity in the standard. There is no more mystery or strange sovereignty in making an eagle, than making the standard gill. It is of the utmost importance that uniformity should reign in respect to both matters. This is all which government is wanted for in either case. Congress has done its duty in establishing the value of coin, and in establishing mints where all future bullion may be turned into coin, at the pleasure of the owner. Let them stay their hand where they are, and let the states repeal all their laws respecting banking, and the use of money, doing nothing more than to enforce contracts, when made, and if there does not instantly grow up, as by magic, a system of currency and banking as much better than the world ever saw, as liberty is better than bondage, then we have overrated the benefits of liberty, and the powers of man set free. We should have banks, then, perhaps more than now, at any rate we should have just as many as were wanted, and just in the form and place which were wanted. We should have a paper currency, good, and known to be so, from Passamaquoddy to the Gulf of Mexico not only, but over the whole commercial world. Our system would never stop specie payments, for there would be no system. Every man or company would stand or fall alone. There would be an end at once to all the feverish excitement about the rates of exchanges and the export of specie. Our currency would be as even and equal, and money affairs as steady, as in this world it is possible to make them, incomparably more steady than at present. The fluctuations would not probably be greater than they are in the rate of freights, not so great in fact—for one of the principal reasons for the fluctuations of freights would be taken away. The currency would be beyond the reach of politicians. They could never disturb it, or create any excitement about it.

From the Agriculturist.

RYE IN WOODLAND.

Mr. F. McGavock, five miles from Nashville, has an excellent pasture from sowing rye in the thick woods last autumn before the falling of the

leaves. If we are not mistaken the grain was put on the surface without ploughing, harrowing, or any other manual operation. The leaves covered it and protected the roots during the freezes of winter, but on the approach of spring it put forth with great luxuriance, and is in every respect one of the best pastures of the country. An advantage not generally thought of in woodland rye is, that if a small portion of it is suffered to mature, nature's laws will effect the second sowing, and by pursuing the plan attentively, a perpetual and permanent pasture may be obtained. To sow rye in land not otherwise employed is, to our minds, the cheapest and best pasture that we have heard of any where.

We think this one idea is worth more than ten years' subscription for the Agriculturist, to any one who will try it.

OF LIME AND OTHER MATTERS.

To the Editor of the Farmers' Register.

I promised you that I would say something of lime and its influence upon my land and crops. As the season advances, and results begin to unfold, I find it difficult, very difficult, to make my communication. For to say any thing inconsistent with the whole truth I hold to be dishonorable; yet I am not without embarrassment, though thus sustained in saying what I see, feel and believe in relation to lime. If therefore I approach this subject with evident timidity, you and your readers will be so good as to impute my faltering to a decent and becoming respect for public opinion. It is said that "truth is powerful, and must prevail." Be it so; but, after threescore years of experience, I feel much doubt. Yes, sir, I do assuredly doubt that "truth must and will prevail." Like the jesting judge who presided upon the trial of Christ, I ask, "What is truth?" For example, suppose I waited upon every man in Virginia and asked him what was lime and its influence upon the earth in the production of vegetable matter—how many quires of paper would it take to print the answers? Setting aside practical men and men of science, no two would give the same answer. Let me therefore be understood to speak strictly of my practice and its results. My first object was to drain my land; for observation had taught me that a single summer upon wet land would destroy its fertility. Plaster was then a valuable application for 15 years; after that, it only colored the vegetation. Yet, for the good it had done, I continued its use. The hope that, as of old, the spirit might again fall upon the waters and move them, excited me to increased applications of plaster; but it was of no avail. Mother earth seemed to turn the "dull cold ear of death" to me. My spirits flagged, and that *ennui* followed which fixes upon man after parting with an old and faithful friend never to meet again. A deep disgust was fast fixing upon my nerves towards every thing like agriculture. While under this feeling, I wandered into a book store, and there met with your treatise upon "Calcareous Manures." I had made two experiments years before with lime, and they had both failed. Upon reading your book, I resolved to pipe all hands to quarters, and never give up the ship. I forthwith purchased all the shells I could find, and took good care to avoid that wet kind of land upon which my former experiments had been made. It resulted well, and my march is now in seven league boots. I did not forget my old and valued friend, plaster. I called upon it as endorser for my new acquaintance, lime; and the way they do business is what is called in the west "a caution." Imagination, with very little assistance from poetry, may well believe that it can hear the song of praise and thanksgiving to the great Father of all, from corn, wheat, oats and grass. No "crying rats" are met in the pathway; and recuperated nature, like the hair-grown Samson, returns to her original powers, wantonly desirous of showing her strength. I especially recommend to root growers the free use of lime. For turnips, if they lime and pulverize well, and then cover the seed with a light cultivator, the crop is sure. Lime, sir, is the moving power of all my crops; and that you may form some idea of my doings, I have no doubt of *laying* by my corn by the 15th of June, and having one hundred tons of clover hay cut, cured and stacked. For, after harvest, we look to nothing but thrashing and securing our wheat and oats. The wheat we never fail to deliver to the neighboring mills by the 10th August; and the oats we are sure to consume in the coming year. I say this not to boast, but to show your young farmers what a man of 62 can do. I keep no overseer, for I have found them more unmanageable than wet, rushy land. I have raised and trained my own servants. They know their duty, and do it faithfully. Having had the good fortune of a Christian mother, I was trained in the ways of Christianity, and I treat my servants kindly, and feed them well. No day in the year finds them without meat and fish and milk. Finally, my dear sir, I offer you my warm salutations for your well directed efforts in restoring our beloved state to her pristine power for production. You will long be remembered as a benefactor.

FAIRFAX.

May 10*th*, 1840.

REARING CHICKENS.

From the Cultivator.

Messrs. Editors—Having made some experiments in the raising of chickens, a business that forms a part of every farmer's occupation, I send you a description, of my present plan of operation, which appears to answer admirably. Under an out-house 16 by 18 feet square, raised 3 feet above the ground, I have dug a cellar, 3 feet below the ground, making the height 6 feet altogether. Eight feet in width of this cellar is partitioned off for turnips, the remaining 10 by 16 feet, being sufficiently large to accommodate 100 chickens, or even more. This cellar is enclosed with boards at present, but it is intended to substitute brick walls in the course of a year or two. The roost is made sloping from the roof to within 18 inches of the ground or floor; 12 feet long by 6 feet wide. The roost is formed in this way: 2 pieces of 2 inch plank, 6 inches wide and 12 feet long, are fastened parallel 5 feet apart by a spike or pin to the joist above, the lower end resting on a post 18 inches above the ground. Notches are made along the upper edge of these plank, 1 foot apart, to receive sticks or poles from the woods, the bark on. When

it is desirable to clean out the roost, the poles being loose are removed; the supports working on a pivot are raised and fastened up, then all is clear, for the work is clearing out. I next provide the chickens with corn, oats and buckwheat, in 3 separate apartments, holding about half a bushel each, which are kept always supplied. They eat less, I find, if allowed to help themselves to what they want than if fed to them in the usual way: for in the latter case each tries to get as much as it can, and thus burdens itself, but finding in the former case that they have abundance, they eat little, and that generally in the morning early, and in the evening going to roost. I have 60 chickens, and they eat about 6 quarts per day of the three kinds of grain, in the proportion of twice as much corn as buckwheat or oats. In the roost is also placed a trough of water, renewed every other day; burnt oyster shells, shell-marl and ashes. A row of nests is constructed after a plan of my own, and does well. It is a box 10 feet long and 18 inches wide; the bottom level, the top sloping at an angle of 45 degrees to prevent the chickens roosting on it; the top opens on hinges. The nests, eight in number, are one foot square; the remaining six inches of the width is a passage way next to the wall, open at each end of the box, and another opening midway of the box. The advantage is to give the hens the *apparent* secrecy they are so fond of.

The following are the advantages of this plan of keeping chickens. By having a roosting place partly under ground, the chickens can keep warmer through the winter than any roost above ground could be made without fire; and this is absolutely necessary to induce them to lay. When fed plentifully in the winter they lay enough eggs to pay for the grain, and in the spring they will repay fourfold. Even now, February 17th, our hens lay enough eggs to pay twice over for the grain they eat. I would recommend this plan to all who wish to make their chickens profitable. As fowls are very troublesome, running about the farm, I propose to enclose a few rods square of ground, with a pale fence 8 feet high, and confine them in that, allowing them occasionally a little more liberty.

Respectfully yours,

E. H. VANUXEM.

Long-Branch, N. J., Feb. 17, 1840.

CALCAREOUS MANURES.

From the Southern Cabinet.

Sir—Attention to the uses of calcareous manures has greatly increased within the last year or two, and many inquire of me as to the appearance, the component parts, and mode of using it on land. I always refer them to Mr. Ruffin's book, and to his valuable periodical publications, for practical instruction. I have various specimens of marl, and of the magnesian lime-stone, found in that portion of our state which ranges within eighty or ninety miles of the sea-coast from North Carolina to Georgia. I now leave some of them at your office for inspection. I believe that it may be found in almost every parish of this portion of the state, and on the banks of most of our water courses. Several valuable beds have been discovered within two years, where they were not previously known to be, and where they would probably have passed unnoticed, but for the interest lately excited by its valuable effects as a manure in Virginia, New Jersey, and elsewhere. I have seen it in St. Matthew's parish, at Pinckney's ferry, and Caldwell's plantation, near McCord's ferry, and in the neighborhood of Manchester. I have heard of it in Barnwell near the Lower Three Runs, and on the Peedee river below Society Hill: but do not know of its having been found above this line, until we come to the fine limestone rock in Spartanburgh.

Most of what I have seen can be dug very near the surface of the earth, and reduced to powder with very little trouble—some will moulder into powder by drying in the weather. The harder kind requires burning and slacking like lime, to make it fine enough for manure. In this state I am disposed to believe that it is peculiarly suited to cold, clayey, stiff soils. The fossil shells, large and small, and the marine shells on the sea-coast, of course require to be burned and slacked before they can be used as manure.

The following results were obtained from some of the specimens analyzed—each one hundred grains:

	Lime.	Magnesia.	Clay and sand.
Dr. P. G. Prioleau's, on Wassamasaw	50 grs.	40 grs.	6 grs.
Do., at Isaac Bradwell's - - - -	33	45	8
Isaac Bradwell's, on Four Holes - -	50	28	10
J. J., near Inabnet's, on do. - - - - -	19	63	11
John Brisbane's, Ashley river - -	41	27	24
Do., High-land	34	40	23
C. G. Capers, St. Helena Island -	38	25	28
J. J., Indian-field creek - - - - -	30	30	35

Frederick Porcher, near the Santee canal.

Mrs. Laurens, near Mepkin bridge.

Dr. P. G. Prioleau, near Biggin bridge; and several others not preserved.

The result is from twenty to fifty per ct. of lime, and from twenty-five to sixty-three per ct. of magnesia. If, as some believe, the magnesia is as valuable as the lime, in this earth as a manure, then may we account for its fine effects, for we have of the two united from sixty to ninety per ct. of active ingredients in the marl. Some have been discouraged from the use of marl, by observing that the stony lumps of hard marl have been for ages ploughed up in some fields that are still poor and unproductive. We believe that if these gentlemen would make the old negroes and children collect these stones, and either beat them as fine as brick dust, or burn them, so that they could be easily pulverized and intermixed with the soil, then the produce of their barren fields would be increased ten per cent. the first year, fifty per cent. the second year, and progressively increased every year to three hundred or four hundred per cent. beyond what they now obtain. It may be asked by some, what are they to do who cannot readily procure marl? We refer them to the analysis of marls, that they may obtain a substance as near as possible to the nature of marl. The marls of Europe and the north, consist almost en-

tirely of clay and lime, in various proportions, but generally about one-third of lime and two-thirds of clay.* Marsh-mud is valuable because it contains both of these, although the lime is in small proportions. Add lime or dead shells to marsh-mud, and you make a very complete marl. Clay is found in vast quantities near all our sandy lands: if this alone were spread and intermixed, it would stiffen the soil, and enable it to retain the moisture which now passes rapidly through it and does but little good to the crop. Let some lime be added to this clay and you have marl. So also with the mud from ponds, creeks, swamps, bays and branches, that run in or near to every field. If lime be added to these last, you not only have marl but decayed vegetable manure also.

Mr. Ruffin says, that two to three hundred bushels of marl to the acre, thrown broad-cast, is generally the best proportion. I obtained very satisfactory results from sixty and ninety bushels to the acre when put into the hills with the corn; the produce would probably have been greater, if I had increased the proportion of marl.

I think that Mr. Ruffin has fallen into one error, from his not being sufficiently acquainted with chemistry, an unfortunate error, as it excites doubts of all the benefits ascribed by him to lime. He gives the analysis of some lands which he says contain no lime whatever, and yet they are very productive and rich. If Mr. Ruffin would add with his own hands any quantity of sulphate of lime, or of oxalate of lime, to this very soil, the result would be the same, with the tests that he used. His tests cannot detect these preparations of lime, and yet they are believed to be the most powerful forms in which lime can be applied to vegetation. The effects of sulphate of lime, gypsum, or plaster of Paris, are well known, and it exists in many soils by a process of nature. So, no doubt, does the oxalate of lime, formed by the decomposition of oxalis (sorrels,) rumex (docks,) and other weeds growing luxuriantly on such lands, the acid of which unites to the lime wherever found, and then it can only be discovered after exposure to the heat.

Your most obedient servant,

JOS. JOHNSON.

Charleston, April 2d, 1840.

I have reason to believe, that calcareous manures are this year used pretty extensively by five or six planters, and tried as experiments by as many more. J. J.

[We rejoice to learn from the above article, that marl has been employed by the planters of South Carolina, even to the slight extent stated. We have formerly several times referred to the rich resources of that state for its agricultural improvement; and, even to the last time, expressed regret that they were *entirely* neglected. But if even "five or six planters" are this year making *proper* applications of marl in South Carolina, it must lead to extensive and general improvement by that means.

The large proportion of [carbonate of] magnesia which Dr. Johnson reports as so generally present in the marls of South Carolina, is a remarkable and interesting fact, which requires attention and full investigation. Writers of reputation have maintained that magnesia is hurtful to land. We have no experience on that head, but do not concur in that opinion.

Next, as to matters personal: If the writer of the above article had merely charged, in general terms, the author of the 'Essay on Calcareous Manures,' as "not being sufficiently acquainted with chemistry," no reply would have been made, because that fact has been fully and expressly admitted by himself in the work in question. But as it is charged that a particular "error" is the effect of that want of sufficient knowledge, and that that error is so important as to "excite doubts of all the benefits imputed by the author to lime," it is proper to say, that the error charged has no existence; and that Dr. Johnson either has not read, or has not understood the reasoning of the work, which he speaks of so approvingly in other respects. The author did indeed state that very many of the most fertile soils, and indeed almost all soils, rich and poor, of all the great Atlantic slope of the United States, were totally destitute of *carbonate of lime;* and he still maintains this important proposition, which he was the first to announce. But so far from asserting the absence of *lime*, in all or any other combinations, directly the reverse was maintained; and the ground thus assumed forms an important and essential part of the theory of the causes of fertility or barrenness of soils. To establish this general existence of lime in some other state of combination than the carbonate in all rich soils is the main object of the reasoning and proofs in the chapter on "neutral and acid soils," (page 22, second edition,) and the truth there established is relied on to sustain the subsequent reasoning throughout, and is particularly referred to, in several cases, for explanation of particular and remarkable effects. Two of them, now remembered, are in the chapter on the "permanency of calcareous manures" (p. 58,) and the explanation of the inaction of gypsum on acid (or ordinary poor natural) soils. (p. 92.)—ED. F. R.]

VALUE OF ASHES.

From the Cultivator.

Messrs. Gaylord and Tucker—From observation and actual experiment, I have come to the conclusion that leached ashes are worth at least six cents per bushel, to incorporate into a gravelly

* Not so as to the marls of lower Virginia, which it is presumed are meant to be included in the above remark. Very few of these contain much clay; and their earth, other than carbonate of lime, is mostly of silicious sand.—ED. F R.

soil; and that unleached are worth four times as much as leached. Care should be taken to mix unleached ashes well with the soil. This fact shows the impolicy of farmers selling their ashes for 12½ cents per bushel. J. TOWNER.

PIGS.

From the Maine Cultivator.

Mr. Editor :—As the raising of pigs is a thing of considerable importance, I will state how I lost a fine litter two years since, when they were three weeks old. I put into their pens some chaffy wheat straw. The pigs went to rooting and champing it. They were taken sick, they lived from one to three weeks, the beards they swallowed, doubtless caused their death. My brother had a pig in the fall, his pen was wet, and he threw in a bushel, of wheat chaff, his pig eat some of it, and died soon after. I knew a man who had a fat hog that eat some of his wheat chaff, the next day he was taken with vomiting, and he killed him, and on examining his swallow he found it coated with beards of wheat which caused his death. Oat straw is perfectly safe.

FRANCIS WINGATE.

DURHAM CATTLE.—AT WHAT AGE BEST TO IMPORT THEM—WILL THRIVE ON OUR WORST PASTURES—AND MAY BE BRED FROM AT ONE YEAR OLD.

From the Southern Cabinet.

Dear Sir—Having read several articles in your paper on the Durham cattle, I write you this to add to the mass of information already presented to the public. The experience of your other friends differs so entirely from my own, that I am inclined to believe some of us have fallen into error. It is affirmed that the Durhams are too delicate in construction, require more feed, and in all other respects are more unsuited to our climate than the other breed of cattle. My experience is directly the other way. For the last six years I have seen many Durhams, Devons, and some Ayrshire, imported into Charleston and its vicinity. Under *proper* treatment they have all of them fulfilled *here* the respective characteristics they have always borne *elsewhere*. Under *improper* treatment they have all of them suffered from delicacy of constitution, &c. All cattle imported from abroad, to become acclimated, must undergo the same changes of constitution as foreigners coming for the first time amongst us. If you expect cattle from Europe, where they are generally housed, and fed on the richest and best of food, to keep healthy and fat, when turned out upon our razor-shaved meadows, and corn-stalk fields, you will be sadly disappointed, and even when housed and well fed, if you expect them not to pant during our summers, and to die under the influence of our noxious climate, you will be as much out of the way, as to look for health and beauty on the cheek of a mountain lass working amid the miasma of our low country rice-fields.

Most of us, at a very high price, import the Durham cattle when full grown. Their constitutions have been already formed and accustomed to the climate whence they came, and it is impossible for them to undergo the radical and necessary change required here. Were we to import at a younger age, the result would be different. Out of twenty or thirty bulls and cows imported from Europe, the north, and Kentucky, during the past year, I know of but three or four now surviving. Out of the same number of calves, I know of as few that have not stood our climate.

But to the point from which I have diverged. About three years since I purchased in Charleston a Durham bull-calf one year old. I turned him among my commons cattle, and only housed and fed him at night. He survived the summer, and is now perhaps one of the finest bulls in this state. Having supplied myself with several of his get, I sold him to Jenkins Mikell, esq., of Edisto Island, who assures me that although he has turned him upon nothing but the common marsh pastures of his island, he has all the year kept fatter and in better health than any of his common cattle. By this bull, when but eighteen months old I got twelve calves. The pasture upon which they have fed is a bad one, and yet these calves have kept fat, and are (I speak with due care,) twice as large as calves of other cows by common bulls. I have several calves from this bull, which though but one year old, are as large as their mothers. I now own a white Durham bull dropped two years since from a very beautiful Durham cow imported by Col. Hampton. I raised him from the bottle, until six months old, and then turned him out to pasture, feeding him at night as I did my other cattle. At one year old I put him to sixteen of my cows, and this season have sixteen of his calves. Though from common Carolina cows, every one who has seen these calves has been struck with their superior beauty of form, and enlarged size, when compared with the common breed. That I have not taken up a partial opinion, let the following fact speak. One of these calves from a very inferior cow, I sent to market with two other calves from good cows, though by a common bull. The calf by the Durham bull, though four weeks younger, brought twelve dollars, while the other two brought only eight dollars apiece. I hesitate nothing in saying, upon my own experience, and upon information collected from several of my friends who are competent to speak, that the Durham feed closer, live on coarser food, grow larger, and give more milk than any other cattle which can be produced in our climate. Their butteraceous qualities, like that of all other breeds, depend upon the butteraceous qualities of the food they get. If you feed them to give much milk, expect them to give less butter, and *vice versa*. I owned a Durham cow, which by a particular mode feeding, I could make give thirty quarts of milk per day, and yet the same milk would not yield as much butter as when I fed her to give but twelve or fourteen quarts. I have some calves from the most beautiful Devon bull ever brought to this state. They are fine calves, but not so good as the Durhams.

I have a full blooded Durham heifer two years old. It has been raised entirely upon one of the poorest pastures in the low-country. For size, beauty, and every other qualification, I can safely put it against any full grown Devon, Ayrshire, or other cow, I have ever seen. I must distinctly re-

peat, that this calf has lived on the common pasture. It has scarcely ever tasted grain. Both it and the young bull I own, live on the same pasture with my other cows, and are more thrifty.

It is said that to have these cattle in perfection you must feed them high and attend them well. So you must; but in the low country where we must have a large flock of cattle, we cannot afford to do so. Must we on that account have nothing to do with the breed? I think not. If we cannot have this cattle in the perfection they are found in Europe, we may nevertheless introduce them to improve our common breed, and any one who will take this view only, will attain much.

We all know how much a cross of breeds will do for cattle; and it is from the want of this as much as from any other cause that our native stock have degenerated so much. Under the very best system of attention and feeding, if you do not frequently cross the breed and relationship of animals they will degenerate in size and quality. There are few plantations in South Carolina, where this fact, though so notoriously obvious, has been attended to, and the proper correctives applied. For one hundred dollars, a Durham calf of the purest breed can be delivered in Charleston. At one year of age he is fit to put to cows, and from what I have seen I think the get of bulls at this age the best. I have tried them from one to five years of age, and find the calves of the former always the finest in form and size, and have satisfied some of the most skeptical upon this point. When I first advanced this I was laughed at, because contrary to the supposed experience of the country. I say supposed experience, because the custom was only founded on supposition. Every one who will pay attention to the matter, will find, that even among his common cattle the finest calves are invariably by his youngest bulls. My old cow-driver, who has had forty years' experience, vouches this truth. I am opposed to none of the other breed of cattle; they are all excellent of their kinds. The object of this hurried letter is to prove that the introduction of fine cattle amongst us, will improve our native breeds, and that, too, on the very worst of pastures. Dr. O'Hear and Dr. Harleston of this parish, have with myself bred from Durham bulls, for the last few years, and we are now fully convinced that the calves thus bred have suffered drought, inattention, and I may actually say, *starvation*, better than calves from the native bred. The gentlemen whose names I have used, will excuse the liberty herein taken. I do it for the confirmation of truth.

Respectfully yours, &c.,

B. R. CARROLL.

[From 'Transactions of the Essex Agricultural Society.']

ON EXPERIMENTS ON MANURES.

To the trustees of the Essex Agricultural Society.

Gentlemen—The only claim to which the attention of the committee on experiments on manures has been called, is that of Dr. Andrew Nichols, of Danvers. His farm in Middleton was visited in July and September. Early in the spring he had caused unleached wood-ashes to be spread on low and cold soils, and the crops of grass gave evidence that the application was very favorable. It had produced a heavy burden of grass on land which otherwise would have had but a light and sour crop.

His corn was manured with a compost made of a small portion of animal manure, seventy bushels of ashes and meadow or peat mud. The soil is a sandy loam. The growth in July was luxuriant, and in September there was a handsome display of full-grown, well-filled ears, in the judgment of the committee about fifty bushels to the acre. This in some circumstances would not be considered a large yield, but the soil is naturally light and for many years had not been well manured. The committee were satisfied by the appearance of the crop, that this year the proper manure and good treatment had been applied, and that in ordinary seasons a compost of ashes, meadow mud and barn manure, will, on sandy and loamy soils, produce a fair crop of corn. In the locality of Dr. Nichols's farm, it would be difficult and expensive to procure animal manure in sufficient quantities to plant any considerable extent of land, and we know of no cheaper or better substitute.

The attention of the committee was also directed to a piece of barley, on which a solution of potash and peat mud had been applied, and the quantity of straw and grain appeared to have been doubled by the operation. But the advantages of this application were still more apparent on a small portion of land on which onions had been sown. Although it was not in proper tilth for such a crop, it produced at the rate of six hundred and forty bushels to the acre. On a small part of the land none of the solution had been used; here, the crop was very light, giving evidence that the superiority of the crop was owing to the novel application.

The subject is important to farmers. Manure is the capital on which they do business. And the man who teaches them how to obtain it at a reasonable rate and in sufficient quantities, does the public better service, than if he lectured the livelong day on copper and silver mines, and amused the sleepy hours with golden dreams.

The committee think Dr. Nichols's experiment valuable, and his statement satisfactory; they recommend that it be published, and that the society's premium of twenty dollars be awarded to him.

For the committee,

DANIEL P. KING.

Danvers, Dec. 28, 1839.

Dr. A. Nichols's statement. To the committee of the Essex Agricultural Society on manures.

Persuaded of the importance of the discoveries made by Dr. Samuel L. Dana, of Lowell, and given to the world through the medium of the reports of Professor Hitchcock and Rev. H. Colman, to the legislature of Massachusetts, concerning the food of vegetables, geine, and the abundance of it in peat mud, in an insoluble state to be sure, and in that state not readily absorbed and digested by the roots of cultivated vegetables, but rendered soluble and very easily digestible by such plants by potash, wood-ashes, or other alkalies, among which is ammonia, one of the products of fermenting animal manures, I resolved last year to

subject his theories to the test of experiment the present season. Accordingly I directed a quantity of black peat mud, procured by ditching for the purpose of draining and reclaiming an alder swamp, a part of which I had some years since brought into a state highly productive of the cultivated grasses, to be thrown into heaps. During the winter I also had collected in Salem, 282 bushels of unleached wood-ashes, at the cost of 12½ cents per bushel. These were sent up to my farm, a part to be spread on my black soil grass lands, and a part to be mixed with mud for my tillage land. Two hundred bushels of these were spread on about six acres of such grass land while it was covered with ice, and frozen hard enough to be carted over without cutting it into ruts. These lands produced from one to two tons of good merchantable hay to the acre, nearly double the crop produced by the same lands last year. And one fact induces me to think, that being spread on the ice, as above mentioned, a portion of these ashes was washed away by the spring freshet. The fact from which I infer this is, that a *run* below, over which the water coming from the meadow, on which the largest part of these ashes were spread, flows, produced more than double the quantity of hay, and that of a very superior quality to what had been ever known to grow on the same land before.

Seventy bushels of these ashes, together with a quantity not exceeding thirty bushels of mixed coal and wood ashes made by my kitchen and parlor fires were mixed with my barn manure, derived from one horse kept in stable the whole year, one other horse kept in stable during the winter months, one cow kept through the winter, and one pair of oxen employed almost daily on the road and in the woods, but fed in the barn one hundred days. This manure was never measured, but knowing how it was made, by the droppings and litter or bedding of these cattle, farmers can estimate the quantity with a good degree of correctness. These ashes and this manure were mixed with a sufficient quantity of the mud above mentioned by forking it over three times, to manure three acres of corn and potatoes, in hills four feet by about three feet apart, giving a good shovel full to the hill. More than two-thirds of this was grass land, which produced last year about half a ton of hay to the acre, broken up by the plough in April. The remainder was cropped last year without being well manured, with corn and potatoes. Gentlemen, you have seen the crop growing and matured, and I leave it to you to say whether or not the crop on this land would have been better had it been dressed with an equal quantity of pure, well rotted barn manure. For my own part I believe it would not, but that this experiment proves that peat mud, thus managed, is equal, if not superior, to the same quantity of any other substance in common use as a manure among us; which, if it be a fact, is a fact of immense value to the farmers of New England. By the knowledge and use of it, our comparatively barren soils may be made to equal or excel in productiveness the virgin prairies of the west. There were many hills in which the corn first planted was destroyed by worms. A part of these were supplied with the small Canada corn, a part with beans. The whole was several times cut down by frost. The produce was three hundred bushels of ears of sound corn, two tons of pumpkins and squashes, and some potatoes and beans. Dr. Dana, in his letter to Mr. Colman, dated Lowell, March 6, 1839, suggests the trial of a solution of geine as a manure. His directions for preparing it are as follows: "Boil one hundred pounds of dry pulverized peat with two and a half pounds of white ash, (an article imported from England,) containing 36 to 55 per cent. of pure soda, or its equivalent in pearl-ash or potash, in a potash kettle, with 130 gallons of water; boil for a few hours, let it settle, and dip off the clear liquor for use. Add the same quantity of alkali and water, boil and dip off as before. The dark colored brown solution contains about half an ounce per gallon of vegetable matter. It is to be applied by watering grain crops, grass lands, or any other way the farmer's quick wit will point out."

In the month of June I prepared a solution of geine, obtained not by boiling, but by steeping the mud as taken from the meadow, in a weak lie in tubs. I did not weigh the materials, being careful only to use more mud than the potash would render soluble. The portion was something like this: peat 100 lbs., potash 1 lb., water 50 gallons; stirred occasionally for about a week, when the dark brown solution, described by Dr. Dana, was dipped off and applied to some rows of corn, a portion of a piece of starved barley, and a bed of onions sown on land not well prepared for that crop. The corn was a portion of a piece manured as above mentioned. On this the benefit was not so obvious. The crop of barley on the portion watered was more than double the quantity both in straw and grain to that on other portions of the field, the soil and treatment of which was otherwise precisely similar.

The bed of onions which had been prepared by dressing it with a mixture of mud and ashes previous to the sowing of the seed, but which had not by harrowing been so completely pulverized, mixed and kneaded with the soil as the cultivators of this crop deem essential to success, consisted of three and a half square rods. The onions came up well, were well weeded, and about two bushels of horse manure spread between the rows. In June, four rows were first watered with the solution of geine above described. In ten days the onions in these rows were nearly double the size of the others. All but six rows of the remainder were then watered. The growth of these soon outstripped the unwatered remainder.

Mr. Henry Gould, who manages my farm on shares, and who conducted all the foregoing experiments, without thinking of the importance of leaving at least one row unwatered, that we might better ascertain the true effect of this management, seeing the benefit to the parts thus watered, in about a week after treated the remainder in the same manner. The ends of some of the rows, however, which did not receive the watering, produced only very small onions, such as are usually thrown away as worthless by cultivators of this crop. This fact leads me to believe that if the onions had not been watered with the solution of geine, not a single bushel of a good size would have been produced on the whole piece. At any rate, it was peat or geine, rendered soluble by alkali, that produced this large crop.

The crop proved greater than our most sanguine expectations. The onions were measured in the

presence of the chairman of your committee, and making ample allowance for the tops which had not been stripped off, were adjudged equal to four bushels to the square rod, or at the rate of 640 bushels to the acre. In these experiments 7 lbs. of potash, which cost 7 cents a pound bought at the retail price, were used. Potash, although dearer than wood-ashes at 12½ cents per bushel, is, I think, cheaper than the white ash mentioned by Dr. Dana, and sufficiently cheap to make with meadow mud, a far cheaper manure than such as is in general used among our farmers. The experiment satisfies me that nothing better than potash and peat can be used for most, if not all our cultivated vegetables, and the economy of watering with a solution of geine, such as are cultivated in rows, I think cannot be doubted. The reason why the corn was not very obviously benefited, I think, must have been that the portion of the roots to which it was applied was already fully supplied with nutriment out of the same kind from the peat ashes and manure put in the hill at planting. For watering rows of onions or other vegetables, I should recommend that a cask be mounted on light wheels, so set that like the *drill* they may run each side of the row and drop the liquid manure through a small tap hole or tube from the cask, directly upon the young plants. For preparing the liquor, I should recommend a cistern about three feet deep and as large as the object may require, formed of plank, and laid on a bed of clay and surrounded by the same, in the manner that tan vats are constructed; this should occupy a warm place, exposed to the sun, near water, and as near as these requisites permit to the tillage lands of the farm. In such a cistern, in warm weather, a solution of geine may be made in large quantities, with little labor and without the expense of fuel, as the heat of the sun is, I think, amply sufficient for the purpose.* If from further experiments it should be found economical to water grass lands and grain crops, a large cask or casks placed on wheels, and drawn by oxen or horse power, the liquor from the casks being at pleasure let into a long narrow box, perforated with numerous small holes, which would spread the same over a strip of ground, some 6, 8, or 10 feet in breadth, as it is drawn over the field, in the same manner as the streets in cities are watered in summer. ANDREW NICHOLS.

I certify that I measured the piece of land mentioned in the foregoing statement, as planted with corn, on the 21st of September, 1839, and found the same to contain two acres, three quarters, thirty-one rods. JOHN W. PROCTOR, *Surveyor.*

From Hayward's Science of Agriculture.

HAYMAKING.

Having observed, that in a season where there was no rain whatever, and the hay had been made with rapidity, and carried within a short time after it had been cut, that a greater quantity had been injured by being over-heated and burnt, than in a catching, irregular season; that when hay had not heated in the stack, it was frequently mouldy; that as hay lost its native green color and approached a brown, it lost its nutritive qualities; and that, altogether, the making of hay, as usually conducted, was a very precarious and troublesome operation; I determined on trying to arrange a system on more regular and certain principles, and in which I succeeded: and by adopting a certain and regular course of operations, was enabled to make my hay of a uniform good quality; and, let the weather be as it might, at a pretty regular expense for labor, and considering such a process not only of importance, as it insures a more perfect quality, but as it affords a more certain protection against the injuries usually consequent on the uncertainty of the weather, and over-heating in the stock, and that it thus removes two great causes of anxiety, it may be well worth the public attention.

In the first place, then, as to the state of the weather—it generally happens at this season of the year, that there are three or four rainy and three or four dry days;* therefore, on beginning to cut the grass, as it is well known that grass may be cut and suffered to remain in the swarth for several days without injury; and it being desirable, where hands are plenty, to have a good quantity, or as much as will complete a stack in a day, in the same state of forwardness, I should prefer, rather than to wait for fine weather, to begin to cut in rainy weather. However, be this as it may, the swaths should not be opened but on a fine day, and when this is done, the grass should be well shaken apart and equally spread over the ground; and as soon as the upper surface is dry, turn it well over, and in this operation great care should be taken to open and spread any cocks that may not have been divided in the first opening: this being done, commence raking into wind-rows in time, that the whole may be made into small cocks before the night. *The second day these cocks must remain untouched, let the weather be wet or dry.* the third day, if the weather be certain and fine, throw the cocks open; but if the weather be wet or threatening, they may remain another day, or until the weather is certain to be fine for the day. The cocks should then be thrown, according to the crop, into beds of two or three rows, and after three or four hours' exposure, turned over, and taking time to gather the whole into wind-rows and cocks before night; let this operation commence accordingly, and *none be left open.* The day after this, which in fine weather will be the fourth, *the cocks must again remain untouched, or not be opened, whether the weather be wet or dry.* On the fifth, or the next dry day, these cocks will only require to be opened for an hour or two, after which time they will be fit for the stack.

The novelty of this mode, consists only in suffering the hay to remain in cock the second or third, or alternate days; and at first sight it may appear that so much time in fine weather must be lost, but this is by no means the case, for whilst the hay remains in cocks, a slight fermentation, or what is termed sweating, will take place; and in consequence, after it has been opened on the third and fifth days, it will prove to be just as forward as if it had been worked every day; and the advantages resulting from this, are obviously the following:

* Perhaps in an excavation in a peat meadow, which would fill with water spontaneously, a solution of geine might be still more cheaply obtained, by simply adding potash, ashes, &c. to the stagnant water.

* In England,

by shortening the time of open exposure, the color of the hay is more perfectly preserved, and consequently, the quality; and the fermentation or sweating which takes place in the cocks, proves so much to have diminished the principle or inclination, as to prevent its heating injuriously in the stack; and the whole operation of making, whether it takes four days or eight, requires three days' labor only; and the hay being left in that state every night, in which it is the least possibly exposed to injuries of the weather, and in which it may remain for a day or two in uncertain weather without injurious exposure, most painful anxiety and useless attendance of labors are obviated.

SPEECH OF DANIEL WEBSTER, ESQ.

*At an Agricultural Meeting in Boston.**

Mr. Webster began with stating that he regarded agriculture as the leading interest of society; and as having, in all its relations, a direct and intimate bearing upon human comfort and the national prosperity. He had been familiar with its operations in his youth; and he had always looked upon the subject with a lively and deep interest. He did not esteem himself to be particularly qualified to judge of the subject in all its various aspects and departments; and he neither himself regarded, nor would he have others regard his opinions as authoritative; but the subject had been one of careful observation to him, both in public and private life; and his visit to Europe, at a season of the year particularly favorable for this purpose, had given him the opportunity of seeing its improved husbandry, and as far as it might be interesting, or would have a bearing upon the subject of the evening's discussion, the agriculture of Massachusetts, he would, as the meeting appeared to expect, say a few words upon what had attracted his notice.

How far, in a question of this kind, the example of other countries was to be followed, was an inquiry worthy of much consideration. The example of a foreign country might be too closely followed. It would furnish a safe rule of imitation only as far as the circumstances of the one country correspond with those of the other.

The great objects of agriculture, and the great agricultural products of England, and of Massachusetts, are much the same. Neither country produces olives, nor rice, nor cotton, nor the sugar cane. Bread, meat and clothing are the main productions of both. But although the great productions are mainly the same, yet there are many diversities of condition and circumstances and various modes of culture.

The primary elements which enter into the consideration of the agriculture of a country are four; climate, soil, price of land, and price of labor. In any comparison, therefore, of the agriculture of England with that of Massachusetts, these elements are to be taken particularly into view.

The climate of England differs essentially from that of this country. England is on the western side of the eastern, and we on the eastern side of the western continent. The climate of each country is materially affected by its respective situation in relation to the ocean. The winds, which prevail most, both in this country and in England are from the west; it is known that the wind blows, in our latitudes, from some point west to some point east, on an average of years nearly or quite three days out of four. These facts are familiar. The consequences resulting from them are, that our winters are colder and our summers much hotter than in England. Our latitude is about that of Oporto, yet the temperature is very different. On these accounts, therefore, the maturing of the crops in England and the power of using these crops, creates a material difference between its agriculture and ours. It may be supposed that our climate must resemble that of China in the same latitudes; and this fact may have an essential bearing upon that branch of agriculture which it is proposed to introduce among us, the production of silk.

The second point of difference between the two countries lies in the soil. The soil of England is mainly argillaceous; a soft and unctuous loam upon a substratum of clay. This may be considered as the predominant characteristic in the parts which he visited. The soil in some of the southern counties of England is thinner; some of it is what we should call stony; much of it is a free gravelly soil, with some small part which with us would be called sandy. Through a great extent of country this soil rests on a deep bed of chalk. Ours is a granite soil. There is granite in Great Britain; but this species of soil prevails in Scotland, a part of the country which more resembles our own. We may have lands as good as any in England. Our alluvial soils on Connecticut river, and in some other parts of the country, are equal to any lands; but these have not, ordinarily, a wide extent of clay subsoil. The soil of Massachusetts is harder, more granitic, less abounding in clay, and altogether more stony, than the soil of England. The surface of Massachusetts is more uneven, more broken with mountain ridges, more diversified with hill and dale, and more abundant in streams of water, than that of England.

The price of land in that country, another important element in agricultural calculations, differs greatly from the price of land with us. It is three times as high as in Massachusetts, at least.

On the other hand, the price of agricultural labor is much higher in Massachusetts, than in England. In different parts of England the price of labor is considerably various; but it may be set down as twice as dear with us here.

These are the general remarks, which have suggested themselves in regard to the state of things abroad. Now have we any thing to learn from them? Is there any thing in the condition of England, applicable to ours; or, in regard to which, the agriculture of England may be of use to Massachusetts and other countries.

The subject of agriculture in England has

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* This speech, as first furnished in the reporter's notes, has been published in most of the agricultural papers of the United States. It has since been revised and corrected by its author, and republished in pamphlet form by the original reporter, the Rev. Henry Colman, the Agricultural Commissioner of Massachusetts, together with an appendix by the latter. It is the last edition that is here copied.—Ed. F. R.

strongly attracted the attention and inquiries of men of science. They have studied particularly the nature of the soil. More than twenty years ago, Sir Humphry Davy undertook to treat the subject of the application of chemical knowledge to agriculture in the analysis of soils and manures. The same attention has been continued to the subject; and the extraordinary discoveries and advances in chemical science, since his time, are likely to operate greatly to the advantage of agriculture. The best results may be expected from them. These inquiries are now prosecuted in France with great enthusiasm and success. We may hope for like beneficial results here from the application of science to the same objects.

But although the circumstances of climate and situation and nature of the soil form permanent distinctions, which cannot be changed, yet there are other differences, resulting from different modes of culture, and different forms of applying labor; and it is to these differences that our attention should be particularly directed. Here, there is much to learn. English cultivation is more scientific, more systematic, and more exact, a great deal than ours. This is partly the result of necessity. A vast population is to be supported on comparatively a small surface. Lands are dear, rents are high, and hands, as well as mouths, are numerous. Careful and skilful cultivation is the natural result of this state of things. An English farmer looks not merely to the present year's crop. He considers what will be the condition of the land, when that crop is off; and what it will be fit for, the next year. He studies to use his land, so as not to abuse it. On the contrary, his aim is to get crop after crop, and still the land shall be growing better and better. If he would content himself with raising from the soil a large crop this year, and then leaving it neglected and exhausted, he would starve. It is upon this fundamental idea of constant production without exhaustion, that the system of English cultivation, and indeed of all good cultivation, is founded. England is not original in this. Flanders, and perhaps Italy have been her teachers. This system is carried out in practice, by a well considered rotation of crops. The form, or manner of this rotation, in a given case, is determined very much by the value of the soil, and partly by the local demand for particular products. But some rotation, some succession, some variation in the annual productions of the same land, is essential. No tenant could obtain a lease, or if he should, could pay his rent and maintain his family, who should wholly disregard this. White crops are not to follow one another. White crops are wheat, barley, rye, oats, &c. Our maize, or Indian corn, must be considered a white crop; although from the quantity of stalk and leaf which it produces, and which are such excellent food for cattle, it is less exhausting than some other white crops; or to speak more properly, it makes greater returns to the land. Green crops are turnips, potatoes, beets, vetches or tares, (which are usually eaten while growing, by cattle and sheep or cut for green food,) and clover. Buck or beech wheat, and winter oats, thought to be a very useful product, are regarded also as green crops, when eaten on the land; and so indeed may any crop be considered, which is used in this way. But the turnip is the great green crop of England. Its cultivation has wrought such changes, in fifty years, that it may be said to have revolutionized English agriculture.

Before that time, when lands become exhausted by the repetition of grain crops, they were left, as it was termed, fallow; that is, were not cultivated at all, but abandoned to recruit themselves as they might. This occurred as often as every fourth year, so that one quarter of the arable land was always out of cultivation and yielded nothing. Turnips are now substituted in the place of these naked fallows; and now land in turnips is considered as fallow. What is the philosophy of this? The raising of crops, even of any the most favorable crop, does not in itself enrich, but in some degree, exhausts the land. The exhaustion of the land, however, as experience and observation have fully demonstrated, takes place mainly when the seeds of a plant are allowed to perfect themselves. The turnip is a biennial plant. It does not perfect its seed before it is consumed. There is another circumstance in respect to the turnip plant, which deserves consideration.

Plants, it is well understood, derive a large portion of their nutriment from the air. The leaves of plants are their lungs. The leaves of turnips expose a wide surface to the atmosphere, and derive, therefore, much of their subsistence and nutriment from these sources. The broad leaves of the turnips likewise shade the ground, preserve its moisture, and prevent, in some measure, its exhaustion by the sun and air.

The turnips have a farther and ultimate use. Meat and clothing come from animals. The more animals are sustained upon a farm, the more meat and the more clothing. These things bear, of course, a proportion to the number of bullocks, sheep, swine, and poultry which are maintained. The great inquiry then is, what kind of crops will least exhaust the land in their cultivation, and furnish, at the same time, support to the largest number of animals?

A very large amount of land in England is cultivated in turnips. Fields of turnips of three, four, and even five hundred acres are sometimes seen, though the common fields are much less; and it may be observed here, that in the richest and best cultivated parts of England, enclosures of ten, fifteen, twenty, or thirty acres, seemed more common. Since the introduction of the turnip culture, bullocks and sheep have trebled in number. Turnips, for the reasons given, are not great exhausters of the soil; and they furnish abundant food for animals. Let us suppose, that one bushel of oats or barley may be raised at the same cost as ten bushels of turnips; and will go as far in support of stock. The great difference in the two crops is to be found in the farmer's barn yard. Here is the test of their comparative value. This is the secret of the great advantages, which follow from their cultivation. The value of manure in agriculture is well appreciated. M'Queen states the extraordinary fact, that the value of the animal manure annually applied to the crops in England, at current prices, surpasses in value the whole amount of its foreign commerce.* There is no

* This is a very extraordinary fact, but it rests upon good authority; and when it is considered that this is of course the product of agriculture, as well as going in the great circle, to renew and extend these products, we must have strong impressions of the amazing extent of this great interest. In this case, cattle ma-

doubt that it greatly exceeds it. The turnip crop returns a vast amount of nutritive matter to the soil. The farmer, then, from his green crops, and by a regular system of rotation, finds green feed for his cattle and wheat for the market.

Among the lighter English soils, is that of the county of Norfolk; a county, however, which he had not the pleasure to visit. Its soil, he understood, is light, a little inclined to sand, or light loam. Such soils are not unfavorable to roots. Here is the place of the remarknble cultivation and distinguished improvements of that eminent cultivator, Mr. Coke, now Earl of Leicester.* In these lands, he understood, a common rotation is turnips, barley, clover, wheat. These lands resemble much of the land in our county of Plymouth; and the sandy lands to be found in the vicinity of the Connecticut and Merrimack rivers. The cultivation of green crops in New England deserves attention. There is no incapacity in our soil; and there are no circumstances unfavorable to their production. What would be the best kind of succulent vegetables to be cultivated, whether turnips, or carrots, he was not prepared to say. But no attempts within his knowledge had been made among us of a systematic agriculture; and until we enter upon some regular rotation of crops, and our husbandry becomes more systematic, no distinguished success can be looked for. As to our soil, as had been remarked, there is no inherent incapacity for the production of any of the common crops. We could raise wheat in Massachusetts. The average crop in England is twenty-six bushels to the acre. From his own farm, and it was comparatively a thin and poor soil, he had obtained this summer seventy-six bushels of wheat upon three acres of land. It is not, therefore, any want of capability in the soil; but the improvement and success of our husbandry must depend upon a succession of crops adapted to the circumstances of our soil, climate aad peculiar condition.

In England, a large portion of the turnip crop is consumed on the land where it grows. The sheep are fed out of doors all winter; and he saw many large flocks, thousands and millions of sheep, which were never housed. This was matter of surprise, especially considering the wetness of the climate; and these sheep were often exposed in fields where a dry spot could not be found for them to lie down upon. Sheep were often folded in England by wattled fences or hurdles temporarily erected in different parts, of the field, and removed from place to place as the portions of the crop were consumed. In some cases they were folded and the turnips dug and carried to them. In such case they were always fed upon lands which were intended the next year to be, as far as practicable, brought under cultivation. He had seen many laborers in fields, employed in drawing the turnips, splitting them and scattering them over the land, for the use of the sheep, which was considered better, often, than to leave the sheep to dig for themselves. These laborers would be so employed all winter, and if the ground should become frozen, the turnips are taken up with a bar. Together with the turnips, it is thought important that sheep should have a small quantity of other food. Chopped hay, sometimes a little oil cake, or oats, is usually given. This is called *trough* food, as it is eaten in troughs, standing about in the field. In so moist a climate as that of England some land is so wet, that, in the farmers' phrase, it will not *carry sheep;* that is, it is quite too wet for sheep to lie upon it. In such cases the turnips must be *carried*, that is, removed from the field, and fed out elsewhere. The last season was uncommonly wet, and for that reason, perhaps, he could not so well judge, but it appeared to him it would be an improvement in English husbandry to furnish for sheep, oftener than is done, not only a tolerably dry ground to lie on, but some sort of shelter against the cold rains of winter *(a.)* The turnips, doubtless, are more completely consumed, when dug, split, and fed out. The Swedish turnip, he had little doubt, was best suited to cold climates. It was scarcely injured by being frozen in the ground in the winter, as it would thaw again, and be still good in spring. In Scotland, in the Lothians, where cultivation is equal to that in any part of England, it is more the practice than farther south, to house turnips, or draw them, and cover them from frost *(b.)* He had been greatly pleased with Scotch farming, and as the climate and soil of Scotland more resembled the soil and climate of Massachusetts, than those of England did, he hoped the farmers of Massachusetts would acquaint themselves, as well as they could, with Scotch husbandry. He had had the pleasure of passing some time in Scotland, with persons engaged in these pursuits, and acknowledged himself much instructed by what he learned from them, and saw in their company. The great extent of the use of turnips, and other green crops, in Scotland, is evidence that such crops cannot be altogether unsuited to Massachusetts.

Mr. Webster proceeded to state, that one of the things which now attracted much attention among agriculturists in England, was the subject of tile draining. This most efficient and successful mode of draining is getting into very extensive use. Much of the soil of England, as he had already stated, rested on a clayey and retentive sub-soil. Excessive wetness is prejudicial and destructive to the crops. Marginal drains, or drains on the outside of the fields, do not produce the desired results. These tile drains have effected most important improvements. The tile itself is made of clay, baked like bricks; about one foot in length, four inches in width, three fourths of an inch in thickness, and stands from six to eight inches in height, being hemispherical, or like the half of a cylinder, with its sides elongated. It resembles the Dutch tiles sometimes seen on the roofs of the old houses in Albany and New York, A ditch is sunk eighteen or twenty inches in depth, and these drains are multiplied, over a field, sometimes at a distance of only seven yards apart *(c.)* The ditch, or drain, being dug, these tiles are laid down, with the hollow side at bottom, on the smooth clay, or any other firm subsoil, the sides placed near to each other, some little straw thrown over the joints to

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nure is valued at 4s. sterling; sheep at 3s.; horse at 4s.; pigs, poultry, &c. at 3s. per load; size of load not given; making a grand total of £59,860,000 sterling, or nearly 300,000,000 dollars. This is understood to be "exclusive of quantity dropped by cattle on land during summer, autumn, &c., perhaps one third more; and exclusive of lime, moss, shells, fish, bone dust, &c."—*M'Queen's British Stasistics*, p. 51. H. C.

* He has increased the rental of his farms by his improvements, from twenty-five to two hundred thousand dollars a year. H. C.

prevent the admission of dirt, and the whole covered up. This is not so expensive a mode of draining as might be supposed. The ditch, or drain, need only be narrow, and tiles are of much cheaper transportation than stone would be. But the result is so important, as well to justify the expense. It is estimated that this thorough draining adds often twenty per cent. to the production of the wheat crop. A beautiful example came under his observation in Nottinghamshire, not long before he left England. A gentleman was showing him his grounds for next year's crop of wheat. On one side of the lane, where the land had been drained, the wheat was already up, and growing luxuriantly; on the other, where the land was subject to no other disadvantage, than that it had not been drained, it was still too wet to be sowed at all. It may be thought singular enough, but it was doubtless true, that on stiff clayey lands, thorough draining is as useful in dry, hot summers, as in cold and wet summers; for such land, if a wet winter or spring be suddenly followed by hot and dry weather, is apt to become hard and baked, so that the roots of plants cannot enter it. Thorough draining, by giving an opportunity to the water on the surface to be constantly escaping, corrects this evil. Draining can never be needed to so great an extent in Massachusetts, as in England and Scotland, from the different nature of the soil; but we have yet quantities of low meadow lands, producing wild, harsh, sour grasses, or producing nothing, which, there is little doubt, might be rendered most profitable hay fields, by being well drained *(d.)* When we understand better the importance of concentrating labor, instead of scattering it; when we shall come to estimate, duly, the superior profit of "a little farm well tilled," over a great farm, half cultivated and half manured, overrun with weeds, and scourged with exhausting crops, we shall then fill our barns, and double the winter feed for our cattle and sheep by the products of these waste meadows.

There was in England, another mode of improvement, most important, instances of which he had seen, and one of which he regarded as the most beautiful agricultural improvement, which had ever come within his observation. He meant irrigation, or the making of what is called water meadows. He had first seen them in Wiltshire, and was much struck with them, not having before understood, from reading or conversation, exactly what they were. But he had afterwards an opportunity of examining a most signal and successful example of this mode of improvement on the estates of the Duke of Portland, in the north of England, on the borders of Sherwood forest. Indeed, it was part of the old forest. Sherwood forest, at least in its present state, is not like the pine forests of Maine, the heavy hard wood forests of the unredeemed lands of New Hampshire and Vermont, or the still heavier timbered lands of the West. It embraces a large extent of country, with various soils, some of them thin and light, with beautiful and venerable oaks, of unknown age, much open ground between them and underneath their widespread branches, and this covered with heather, lichens and fern. As a scene to the eye, and to the memory by its long existence, and its associations, it is beautiful and interesting. But in many parts, the soil is far enough from being rich. Upon the borders of this forest, are the water meadows of which he was speaking. A little river ran through the forest in this part, at the bottom of a valley, with sides moderately sloping, and of considerable extent, between the river at the bottom and the common level of the surrounding country above. This little river, before reaching the place, ran through a small town, and gathered, doubtless, some refuse matter in its course. From this river the water was taken, at the upper end of the valley, conducted along the edge, or bank, in a canal or carrier, and from this carrier, at proper times, suffered to flow out, very gently, spreading over and irrigating the whole surface, trickling and shining when he saw it, (and it was then November,) among the light green of the new-springing grass, and collected below in another canal, from which it was again let out, to flow in like manner over land lying still further down towards the bottom of the valley. Ten years ago, this land, for production, was worth little or nothing. He was told that some of it had been let for no more than a shilling an acre. It has not been manured, and yet is now most extensively productive. It is not flooded; the water does not stand upon it; it flows gently over it, and is applied several times in a year, to each part, say in March, May, July and October. In November, when he saw it, the farmers were taking off the third crop of hay cut this season, and that crop was certainly not less than two tons to the acre. This last crop was mostly used as green food for cattle. When he spoke of the quantity of tons, he meant tons of dry hay. After this crop was off, sheep were to be put on it, to have lambs at Christmas, so as to come into market in March, a time of year when they command a high price. Upon taking off the sheep in March, the land would be watered, the process of watering lasting two or three days, or perhaps eight or ten days, according to circumstances, and repeated after the taking off of each successive crop. Although this water has no doubt considerable sediment in it, yet the general fact shows how important water is to the growth of plants, and how far even it may supply the place of other sources of sustenance. Now, we in Massachusetts, have a more uneven surface, more valleys with sloping sides, by many times more streams, and such a climate that our farms suffer much oftener from drought than farms in England. May we not learn something useful, therefore, from the examples of irrigation in that country *(e.)*

With respect to implements of husbandry, Mr. Webster was of opinion that the English, on the whole, had no advantage over us. Their wagons and carts were no better, their ploughs, he thought, were not better any where, and in some counties far inferior, because unnecessarily heavy. The snb-soil plough, for which we have little use, was esteemed a useful invention, and the mole plough, which he had seen in operation, and the use of which was to make an under-ground drain, without disturbing the surface, was an ingenious contrivance, likely to be useful in clay soils, free from stone and gravel, but which could be little used in Massachusetts. In general, he thought the English utensils of husbandry were unnecessarily cumbrous and heavy. The ploughs, especially, required a great strength of draught. But as drill husbandry was extensively practised in England, and very little with us, the various implements,

or machines, for drill sowing, in that country, quite surpass all we have. He did not remember to have seen the horse-rake used in England, although he had seen in operation implements for spreading hay, from the swarth, to dry, or rather, perhaps, for turning it, drawn by horses.

There were other matters connected with English agriculture, upon which he might say a word or two. Crops were cultivated in England of which we knew little. The common English field bean, a small brown bean, growing not on a clinging vine, like some varieties of the taller bean, ran in what is called with us the bush form, like our common white bean, upon a slight, upright stalk, two or two and a half feet high, and producing from twenty to forty bushels to the acre. It is valuable, as food for animals, especially for horses. This bean does not grow well, in thin soils, or what is called a hot bottom(*f.*) A strong, stiff, clayey land, well manured, suits it best. Vetches, or tares, a sort of pea, were very much cultivated in England, although almost unknown here, and is there either eaten green, by sheep, on the land, or cut and carried for green food (*g.*)

The raising of sheep, in England, is an immense interest. England probably clips fifty millions of fleeces this year, lambs under a year old not being shorn. The average yield may be six or seven pounds to a fleece (*h.*) There are two principal classes of sheep in England, the long woolled, and the short woolled. Among these are many varieties, but this is the general division, or classification. The Leicester, and the South Down, belong respectively, to these several families. The common clip of the former may be estimated from seven to eight pounds; and of the last from three to three and a half or four. Mr. Webster mentioned these particulars only as estimates; and much more accurate information might doubtless be obtained from many writers. In New England, we were just beginning to estimate rightly the importance of raising sheep. England had seen it much earlier, and was pursuing it with far more zeal and perseverance. Our climate, as already observed, differs from that of England; but the great inquiry applicable in equal force to both countries is, how can we manage our land in order to produce the largest crops, while at the same time we keep up the condition of the land and place it if possible in a course of gradual improvement? The success of farming must depend in a considerable degree upon the animals produced and supported on the farm. The farmer may calculate in respect to animals upon two grounds of profit; the natural growth of the animal, and the weight obtained by fattening. The skilful farmer, therefore, expects where he gains one pound in the fattening of his animal, to gain an equal amount in the growth. The early maturity of stock is consequently a point of much importance.

Oxen are rarely reared in England for the yoke. In Devonshire in Cornwall, ox teams are employed; but in travelling one thousand miles in England, Mr. Webster saw only one ox team, and here they were driven one before the other, and in harnesses similar to the harnesses of horses. Bullocks are raised for the market. It is highly desirable, therefore, both in respect to neat cattle and sheep, that their growth should be rapid and their fattening properties favorable, that they may be early disposed of, and consequently the expense of production lessened.

Is it practicable on the soil and in the climate of Massachusetts to pursue a succession of crops?, He could not question it; and he had entire confidence in the improvements to our husbandry and the great advantages which would accrue from judicious rotation of products. The capacities of the soil of Massachusetts were undoubted. One hundred bushels of corn to an acre had been repeatedly produced, and other crops in like abundance. But this would not effect the proper ends of a judicious and profitable agriculture, unless we could so manage our husbandry that by a judicious and proper succession of crops, the land would not only be restored after an exhausting crop, but gradually enriched by cultivation. It is of the highest importance that our farmers should increase their power of sustaining live stock, that they may therefrom obtain the means of improving their farms.

The breed of cattle in England was greatly improved, and still improving. He had seen some of the best stocks, and many individual animals from others, and thought them admirable. The short horned cattle, brought to this country, were often very good specimens. He said that he had seen the flocks from which some of them had been selected, and they were certainly among the best in England. But in every selection of stock, we are to regard our own climate, and our own circumstances. We raise oxen for work, as well as for beef; and he was of opinion that the Devonshire stock furnished excellent animals for our use. We had suffered that old stock, brought hither by our ancestors, to run down, and be deteriorated. It had been kept up, and greatly improved, in England, and we might now usefully import from it. The Devonshire ox is a hardy animal, of size and make suited to the plough, and though certainly not the largest for beef, yet generally very well fattened. He thought quite well, also, of the Ayrshire cows. They were good milkers, and being a hardy race, on that account, well suited to the cold climate, and to the coarse and sometimes scanty pasturage of New England. After all, he thought, there could be no doubt, that the improved breed of short horns were the finest cattle in the world, and should be preferred, wherever plenty of good feed, and some mildness of climate invited them. They were well fitted to the Western States, where there is an overflowing abundance, both of winter and summer feed, and where, as in England, bullocks are raised for beef only. He had no doubt, also, that they might be usefully raised in the rich valleys of the Connecticut, and perhaps in some other favored parts of the state. But, for himself, as a farmer on the thin lands of Plymouth county, and on the bleak shores of the sea, he did not feel that he could give, to animals of this breed, that entertainment, which their merit deserved.

As to sheep, the Leicester were like the short horned cattle. They must be kept well; they should always be fat; and, pressed by good keeping, to early maturity, they are found very profitable. "Feed well," was the maxim of the great Roman farmer, Cato; and that short sentence comprises much of all that belongs to the profitable economy of live stock. The South Downs are a good breed, both for wool and mutton. They crop the grass that grows on the thin soils, over beds of chalk, in Wiltshire, Hampshire, and Dor-

setshire. They ought not to scorn the pastures of New England.

When one looks, said Mr. Webster, to the condition of England, he must see of what immense importance is every, even the smallest degree of improvement in its agricultural productions. Suppose that by some new discovery, or some improved mode of culture, only one per cent. could be added to the annual results of English cultivation; this, of itself, would materially affect the comfortable subsistence of millions of human beings. It was often said that England was a garden. This was a strong metaphor. There was poor land, and some poor cultivation in England. All people are not equally industrious, careful. But on the whole, England was a prodigy of agricultural wealth. Flanders might possibly surpass it. He had not seen Flanders; but England quite surpassed, in this respect, whatever he had seen. In associations for the improvement of agriculture, we had been earlier than England. But associations now exist. He had the pleasure of attending the first meeting of the National Agricultural Society, and he had found it a very pleasant and interesting occasion. Persons of the highest distinction for rank, talents and wealth, were present, all zealously engaged in efforts for the promotion of the agricultural interests. No man in England was so high as to be independent of the success of this great interest; no man so low, as not to be affected by its prosperity, or its decline. The same is true, eminently and emphatically true, with us. Agriculture feeds us; to a great degree it clothes us; without it, we could not have manufactures, and we should not have commerce. These all stand together, but they stand together like pillars in a cluster, the largest in the centre, and that largest is agriculture. Let us remember, too, that we live in a country of small farms, and free-hold tenements; a country, in which men cultivate with their own hands, their own fee-simple acres; drawing not only their subsistence, but also their spirit of independence, and manly freedom from the ground they plough. They are at once its owners, its cultivators, and its defenders. And whatever else may be under-valued, or overlooked, let us never forget, that the cultivation of the earth is the most important labor of man. Man may be civilized, in some degree, with great progress in manufactures, and with little commerce with his distant neighbors. But without the cultivation of the earth, he is, in all countries, a savage. Until he steps from the chase, and fixes himself in some place, and seeks a living from the earth, he is a roaming barbarian. When tillage begins other arts follow. The farmers, therefore, are the founders of human civilization.

APPENDIX.

Note (a.)—Housing Sheep.

If sheep were allowed to give their voice on the subject, there is little doubt how the question would be decided. Where a shed is open at one side, sheep in case of a cold storm of rain or sleet, will always, if left to govern themselves, seek a shelter. Under other circumstances they are equally disposed to remain in the open air.

The very fine woolled sheep, whose constitutions are tender, require much nursing; and in our climate must be sheltered. This is necessary, also, in order to preserve the fineness of the wool; and some shepherds go so far as to put linen jackets upon them. With respect to the coarse woolled sheep, and the half bloods, many of the best farmers in Vermont and in the western part of Massachusetts, have come to the conclusion that their flocks are, upon the whole, better in health, and that the per centage of loss in their flocks is less, where the flocks are fed at stacks in the field and rarely housed, except occasionally at their own pleasure, than where they are regularly shut up every night in a covered and close fold. Any one, who has been accustomed to the air of a sheep house, where a flock has been confined all night, can hardly doubt that it must be prejudicial to the health of the animals unless their lungs are made of leather.

Our climate differs essentially from that of England; but with us to fold sheep in wet yards is likely to produce the disease of the foot-rot, a most troublesome disorder and extremely difficult to eradicate. If it does not produce the disease, yet if the poison is lurking within the foot, it will bring it out and aggravate it. It is an infectious disorder, and I know from experience, much to be dreaded; though I am not prepared to say with a writer of no small credit, that the only effectual remedy is to cut off the sheep's head.

H. C.

Note (b.)—Turnips.

The common flat or white turnip is little cultivated among us, excepting for the table. The Swedish turnip or ruta baga is much more valued for its solidity, its supposed superior nutritiveness, and its endurance. It may be kept perfectly well until May, and often until June. They are easily grown; but the condition of the land cannot be too much enriched. With respect to the keeping of them through the winter, we protest, on account of the health and comfort of his family, against a farmer's ever putting any of the turnip or cabbage family into his house cellar; but they may be stored in his barn cellar, or a deposit may be made for them on his barn floor if the sides be well filled in and the top carefully covered with hay, for which purpose the poorest will answer. Or I have preserved them in perfection by pitting them in the field where they grew. For this purpose, on the driest part of the field, dig a hole about six inches or a foot in depth, and wide and long according to the quantity of turnips you have to provide for, there deposit your ruta baga after they are dug and trimmed, and raise the pile in a sloping form like the pitched roof of a house. Do this after the dirt has been knocked off the turnips, and they have become as dry as circumstances will admit. Lay on the heap a thin layer of straw, and a thin covering of earth, leaving the south end of the heap, which should be made north and south, to be stopped up with several loose bundles of straw. Then make a few holes with a crow-bar to act as ventilators until the first heat of the turnips is over. Let them remain in this condition until the cold increases, so that they are in danger of freezing; then put another layer of straw and another covering of dirt, smoothed down neatly with a spade, so that it may shed the rain. Your turnips in this way will keep well all winter, and access to them will be easy through the winter at the south end, by removing the loose bundles of straw, and afterwards carefully replacing them. The straw and dirt, by the aid of frost, will make a perfect roof to your turnip house, which will stand firm until the frost is gone. I have kept hundreds of bushels for my stock in this way; and if a farmer desires in the feeding season to make accurate calculations of the amount consumed as he goes on, he can put them up in heaps of one or two hundred bushels each in different parts of his field, managing with them in the way I have described.

The cultivation of green esculent vegetable crops cannot be too strongly urged upon our farmers. We shall never reach an improved husbandry until we get into a regular system of rotation of crops; and green feed for our winter feeding forms a part of that rotation. Condiments or esculents of this sort are as important for our cattle as potatoes and other vegetables are upon the farmer's table. The condition of our cattle, and especially our young stock and our milking stock, would be greatly improved by them. This green feed can be produced in many cases at a less expense than long feed. It makes, from the exact cultivation required, an excellent preparation for grain; and it supplies under proper management, directly and efficiently the means of enriching our farms, and of increasing their productiveness in a rapid ratio.

H. C.

Note (c.)—Draining.

According to the testimony of Mr. Kennedy, formerly M. P., and Mr. James Smith of Deanston, England, the author of this system of draining and inventor of the subsoil plough, before a committee of the British Parliament, these drains where tiles are used, are sunk to a depth of twenty-four inches, and where stones are used, are sunk to a depth of thirty inches; the object in each case being to stir the ground in the course of improvement with the subsoil plough, to the depth of sixteen inches, without disturbing the tiles or the drain. When stones are used the ditch is sunk to the depth of thirty inches; small stones are then thrown in promiscuously to a height of twelve inches; and then a sod of two or three inches thick, inverted, is laid over the stones to prevent the dirt falling in and stopping the passage of the water; the top is then filled up and the field left smooth. The centre or main drain into which the cross drains empty, is sunk to the depth of three feet. These drains are durable and effectual. Tiles have not been used among us; but nearly twelve years ago, I made several hundreds of rods of these covered drains with small rough stone, as above described, in order to drain a wet field. The drains continue to operate well to this time. The value of the land was increased ten-fold; and the increased crops soon paid the whole expense of the improvement. These drains are entirely out of sight; but I would advise, whenever they are made, that their distances and direction should be accurately laid down in a plan of the farm, that they may easily be found in case of interruption.

In England, the improvement is not considered as complete, until, after the land is drained, the whole field is by a gradual process, loosened with a subsoil plough to the depth of sixteen inches. The land is first ploughed to the depth of six inches and a crop of oats is taken; it is then ploughed again and subsoiled, if I may use the expression, to the very top of the drain, care being taken not to bring much of the subsoil to the surface at a time, but the top and the lower soil are intermixed by a gradual process of cultivation. Other crops are then taken from this land, which is cultivated and manured in the usual manner; and the products are enormously increased by this process. I shall give more full details in my third Report of the Agriculture of Massachusetts, now in the press.

H. C.

Note (d.)—Redemption of Peat Meadows.

Some most beautiful examples of the success of redeeming lands by draining, especially bog meadow, are to be found in Saugus, Lynn, Lexington, Framingham, Groton, and other towns in this state. In these cases, lands which were of little value, are now brought into most productive fields, yielding five or six hundred bushels of potatoes and three to four tons of hay per acre besides other crops. These, however, are in general open drains. We have a very large amount of peat land in the state, which is capable of being thus redeemed and made some of the most productive in the state. By the estimation of the learned geological surveyor, there are more than 80,000 acres or 125 square miles. One of the most remarkable examples of this sort of improvement may be found detailed in the appendix to the third Report of the Agriculture of Massachusetts. This was made by Mr. Timothy H. Brown, of Saugus, and deserves particular attention. An account of it is given likewise, in the Reports of the Essex Agricultural Society for 1838-9.

There seems to me no reason why the introduction of the Deanston system of improvement, thorough draining and subsoil ploughing, may not be introduced among us in particular localities, to as great advantage as has been done in Scotland. H. C.

Note (e.)—Irrigation.

A very skilful enterprise of this same kind, on a smaller scale, has been undertaken in Medway, which promises the best results. Here a considerable stream has been dammed and carried in a canal round the whole field of several acres, so as to be allowed to flow upon them over the bank at the pleasure of the owner. Two other examples of irrigation are to be seen, one in the upper part of Dedham, and one in Chelmsford, which, though on a small scale, have been eminently successful. Our improvements are very humble compared with those referred to by Mr. Webster; but they are creditable and encouraging. The struggling steps of infancy must be taken before we can move with the firm gait of manhood. The enriching qualities of water are far from being properly appreciated. In such circumstances as described, it is by no means a simple substance; and it effects an essential purpose in holding in solution the nutriment of the plant with which it mixes in its passage over the soil and percolations into it. H. C.

Note (f.)—The Bean.

The bean *(vicia faba.)*—"The bean is a valuable field plant, as affording food for live stock and in part for man. The varieties of the bean are two, garden and field beans, the white and the gray beans. The best soils for beans, are clay and strong loams. On such soils they generally succeed wheat or oats, but sometimes also clover lays. Turnip soils or sands are by no means proper for them. The climate most favorable to the bean is one neither very dry nor very moist; the first brings on the fly; and the last prevents the setting of the blossoms. The flour of beans is more nutritive than that of oats, as it appears in the fattening of swine." Dr. Darwin thinks them a cheaper provender for horses than that of oats; but being of an oily nature, more difficult of digestion than oats, and he would therefore hesitate in giving them the preference for this object.

The bean is considered as an exhausting crop; but on account of the clean cultivation which is given to it, it often favorably precedes wheat. My own experiments in the cultivation of the English field bean, which I have tried two or three years, resulted in disappointment, as they were in every instance destroyed by a little black fly. This is the great enemy with which they have to contend abroad. Forty bushels to the acre must be regarded as a large yield. From twenty to thirty-five is more common.

The cultivation of the white bean among us, is pursued to a very small extent and in a very slovenly and negligent manner. Land that is under a curse, and considered fit for nothing else, is usually selected for a crop of white beans; and a farmer would as soon think of dressing his children in peacock's feathers as of giving any manure to his white beans. The result is exactly what, under such circumstances, is to

be expected. We have no doubt that, under proper cultivation, beans may be made a highly productive and valuable crop. For feeding sheep, especially fatting-wethers, I have tried and know their value. Intermixed and ground or alternated with Indian corn, they are exceedingly favorable for the thrift of sheep, and may be to a degree profitably used, notwithstanding the customary difference in price. We can hardly expect, however, that they should take the place of Indian corn; a crop which cannot be grown in England, which is not more exhausting than any other grain crop allowed to perfect its seeds, which when consumed on the farm under good management, returns a large amount to the land; and the rough fodder of which, when well cured, is almost an equivalent for the cost of cultivation. H. C.

Note (g.)—The Tare.

The tare or vetch *(vicia sativa)* is a plant which we have sometimes seen growing, but rarely cultivated among us. There is no hindrance in our climate to its cultivation; and perhaps the great reason why the cultivation of the tare or field bean has been neglected or not introduced, has arisen from our capacity to produce Indian corn; and our high estimation, which can hardly be extravagant, of its value as food for the brute and the human animal. As green feed especially, and for the purposes of soiling, undoubtedly the tares might be introduced to great advantage.

"The tare," says Low, "is one of the most esteemed of the leguminous plants of this country, (England.) When used as green forage, they are cut after the pods are formed, but long before the seeds are ripe. Being in the class of crops not allowed to mature their seeds, they are not exhausting to the soil. They are considered as restorative crops, from the quantity of manure which the consumption of them affords. They are exceedingly nutritious, and supply a larger quantity of food for a limited period, than almost any other forage crop. All the animals of the farm are fond of this legume, and all thrive upon it in an eminent degree. Hogs may be fattened entirely upon it. It causes milch cows to give more butter than any other species of food, and it is employed extensively in the feeding of horses. All the English agriculturists are impressed with a high opinion of the value of tares."

Young observes, "tare crops are of such use and importance that not one-tenth of the stock could be sustained without them; horses, cows, sheep and hogs are all fattened upon them; hogs are soiled upon them without any other food. This plant maintains more stock than any other plant whatever. Upon one acre, Davis maintained four horses in much better condition than upon five acres of grass. Upon eight acres he has kept twelve horses and five cows for three months without any other food. No artificial food whatever is equal to this excellent plant."

"Tares cut green," Professor Thaer observes, "draw no nourishment from the soil, whatever; while made into hay they afford a fodder preferred by cattle to pea straw, and more nutritious than hay or any other herbage."

These high encomiums on this plant will, we hope, invite the attention of our farmers strongly to the subject, that experiments may be made among ourselves of their adaptation to our climate and soil; and of the expediency of introducing them among a rotation of crops in our system of husbandry, if we are so fortunate presently as to have a system. Tares are of two kinds, winter and spring, but not distinguishable from the appearance of the seed. The winter tares are sowed in England in September and October, and where they are designed for soiling, the sowing is continued at successive times until May. The spring tares are advised to be sowed as early in the spring as they can be got in. A clay soil is most congenial to their growth; and any rich soil will do, provided it is not too dry. The quantity of seed to an acre is from two and a half to three and a half bushels; the latter quantity where they are to be cut for green fodder; the former where they are cultivated for their seed. It is advised to sow some grain with them, such as rye with winter tares and oats with spring tares, which serve to support them.

It is doubtful whether tares sowed in the fall would survive our severe winters. This, however, can only be determined by some actual experiment. We hope they will have a fair trial. For soiling they must be an excellent article; and I cannot but hope that the practice of soiling will prevail much more among us; especially for the quantity of most valuable manure, which under proper management may be made in this way. I ask leave here to refer to an admirable and encouraging experiment in soiling, on a small scale, in my second Report of the Agriculture of Massachusetts, p. 69. H. C.

Note (h.)—Product of Sheep.

This would seem to be a large yield, but perhaps under good management, not overrated. Mr. Hubbard, an extensive wool dealer at Leeds, whose authority appears to be much relied upon, states the average of the short woolled sheep at 3½ lbs. each, and the long wooled at 7½ lbs. each. McCulloch, in his tables, states the yield of the Teeswater sheep to be 9 lbs. to a fleece; the Lincoln, 10 lbs.; of the Dishley, 8 lbs.; of the Costwold, 9 lbs.; and of the South Downs 2½ lbs.; of the Cheviot, 3 lbs. to a fleece. It is stated in another work that a Mr. Sellar, by dint of persevering attention to the choice of rams, the change of herbage and placing the sheep at different ages upon appropriate pasture, together with supplies of artificial food in the pinching seasons of the year, has raised the average wool of the Cheviot race, to 4 and 4½ lbs. per fleece.

I have known cases of as remarkable improvement here. They show emphatically how much a farmer's success depends on enterprise, care and skill.

I ought to say, in this place, that Mr. Webster is in no respect whatever reponsible for the notes attached to his address. With the exception of those on beans and vetches, he has not seen them. H. C.

From the Franklin Farmer.

IMPROVEMENT OF THE SOIL RESULTING FROM THE GRAZING SYSTEM OF KENTUCKY.

Frankfort, April 6, 1840.

In a late number of the Tennessee Farmer, I find a communication, signed "D.," addressed to the editor of that paper, from which the following is an extract:

"In the Franklin Farmer of December 7th, 1839, published at Frankfort, Kentucky, but recently, I believe, transferred to Lexington, there is an editorial article, from which the following is extracted:

"'In our calcareous lands, we can manufacture our manure on the very spots where we want it to be spread; but on other soils, it must be made in the barnyard and hauled out, and in the former practice, the improvement of the soil will probably be more apparent than in the latter. It is a fact distinguishing the husbandry of some of our best graziers, that their lands, taken in a partially exhausted state, thirty years ago, have not only improved in production every year, but exhibit now the appearance of virgin fertility.'"

Now, sir, to improve exhausted land without be-

ing compelled to resort to the tedious and horrible drudgery of hauling out and spreading manure, is truly a grand desideratum to the practical farmer; and it is much to be regretted, that the writer of the above extract did not favor us with the details of a plan, from which such desirable results can be obtained. If you are not yourself acquainted with the system in question, perhaps you can, through the medium of your paper, obtain the requisite information, which no doubt will be thankfully received and put into operation by many of your subscribers."

Being at the date referred to, the editor of the Franklin Farmer and the author of the remarks on manure, quoted by "D." I am disposed to respond to him. But in doing so, I waive exception to the spirit of incredulity which, it appears to me, lurks in his tone. Any one who has ever intelligently observed the operations on the highly improved farms in the calcareous lands of Kentucky, would at once refer my remarks on our manuring, quoted above, to the processes connected with our grazing system; and these would embrace almost the entire agricultural operations on such farms. I cannot pretend, in the limits to which I am necessarily restricted in a weekly paper, to write out all the "details" of the system referred to; for it would require a volume to do them ample justice; but I think I can present the general outlines of the system in a manner to render it intelligible. In speaking of *manuring*, as connected with the grazing system of Kentucky, I use the term in a general sense; signifying, not only the application of putrescent matters to the soil, but all those ameliorating processes, embracing a judicious rotation of crops, including grasses, which serve to produce and maintain an increased state of fertility. I am aware that, in some quarters, our system is sneered at, on the ground that we do not, technically, manure our fields, that is, haul materials for making manure into a barn-yard, and then, after certain processes, haul out the same upon the fields. But as, besides deriving profits from the products of agricultural labor, the great object of cultivation is to improve the fertility of the soil, I cannot see any objection to the employment of the term, *manuring*, for the result of any practices or processes by means of which these two great ends are reached. If, by the agency of different processes, equal results are obtained; the only subject of consideration, in the choice of one or other of those processes, to effect the desired result, would be, that of its comparative convenience, applicability or economy. That an exceeding degree of fertility is produced and maintained and that large profits are realized under the operations of the grazing system, I need only point to the heavy productions of the grazing farms, and to the great prosperity of the graziers, to show. And in speaking of the fertility *produced* under this system, I mean, literally, that, under its operation, lands taken in what is called a "*worn-out*" state, are brought up to a state of the highest productive capacity. That the same system, therefore, would *preserve*, if not *increase*, the original richness of the virgin soil, is two well established, even if experience were wanting on this particular point, to admit of a doubt. It is to be taken into consideration that this system is of but comparatively recent adoption; that it is not yet fully practised in many sections of our calcareous lands; and that it was commenced in a section where the previous systems, (or rather, bad practices,) had actually skimmed the land of its richest soil. What of fertility was left in the soil, even of this new and rich land, after years of exhausting cultivation, first, in that horrible scourge of land, tobacco, and next in grain, exported to distant markets or consumed in the infernal distilleries of whisky, may be best told by those who, appalled at the prospect of impoverished fields and purses, fled from out this garden of Eden, to procure, still further west, *fresh* lands. Now let us suppose one of these farms, thus exhausted and deserted, passing into the possession of a farmer whose system of husbandry has two cardinal objects in view — to realize annual profits and at the same time maintain a steady progressive improvement in the fertility of the soil. If he gets possession in the fall, he sows down the exhausted fields in rye or wheat, generally rye, and if in the spring, in oats; and in the winter or spring, seeds with red clover, timothy and blue-grass. When the small grain is ripe enough, he turns his stock upon it, feeds it down upon the ground, and then, taking the stock off, allows the clover and other grasses to come forward. The clover coming forward, if the season be favorable immediately after the small grain is eaten down, shades the ground from the intense heat of the sun, which so injuriously affects naked fallows. The field is next grazed by stock; and the mixture of timothy and blue grass with the clover prevents the latter hooving the cattle. The second year the field is also grazed, but the stock is taken off long enough to allow the clover, which is a biennial plant, to ripen its seed, which being shed, clothes the field with clover for two more years if it is desired to keep it that long in grass; but a frequent practice is, if the land be not excessively exhausted to turn the clover under and plant in corn the third year; and this may safely be done, with a confident expectation of gathering, in a favorable season at least, 50 or 60 bushels of corn to the acre, if the land had not been reduced previously, to a state of exhaustion producing less than 25 or 30 bushels. If the exhaustion be more excessive, reducing the production to a point lower than I have stated, it is advisable to let the field remain in pasture four years. The third or fifth year as the case may be, the sod is turned over flat by a sod-plough running just through it, or say two or three inches; then following in the same furrow with another plough, commonly a Cary, from four to six inches deep, bury the sod to that depth; some even follow with a third, to lay the sod ten or twelve inches below the surface, where, being out of the way of the after culture, it gradually decomposes, furnishing food to the growing crop, protecting it from the excessive influences of drought, and deepening the tilth. Whether a third ploughing in the same furrow be proper, is to be determined by the depth of the soil and the character of the subsoil. If the subsoil, that is, the earth below the surface soil, containing no mould, or dark, decayed vegetable matter, be a light, friable, yellow, reddish or brown clay, the plough may run down to it, and, indeed, bring up some of it to the surface, where exposure to the influences of frost, sun and atmosphere, renders it into a fertilizing earth incorporated with the vegetable matter turned under; and this process also effects the very desirable object of deepening the soil. But I suspect it would probably be better to defer this deep

ploughing until the end of the second term of rotation. If the state of fertility has been sufficiently improved by the small grain fed down and by the grasses following, of which a tolerable judgment may be formed by the thickness of the covering of sod, it is advisable to plant the field a second year in corn. A sound judgment must determine the propriety of taking two successive crops of corn from the same field. If the previous covering of grass had been very heavy and the sod turned under in the manner recommended, in nine cases out of ten, other circumstances being equal, a heavier crop of corn will be obtained the second than was the first year, owing to the greater quantity of food afforded the second crop by the more perfect decomposition of the vegetable matter turned under. It is a matter of economy to plant the second year in corn, provided it be justified by the circumstances mentioned; for it is a heavy job to break up the sod for only one crop of corn. But on an exhausted farm, it is not recommended to take two successive crops of corn at the end of the first term of rotation, unless the field laid four instead of two years in pasture; but at and after the end of a second period of rotation, the practice may, both safely and economically be followed, with a fair prospect, in favorable seasons, of making from 75 to 100 bushels to the acre.—When the corn has sufficiently matured, it is cut up and shocked, sixteen hills square, or 256 hills forming a shock. The shocks are hauled out in the winter on a field most needing improvement and fed on the ground to the stock. It is spread generally over the feeding field, and of course thickest on the poorest spots. In breaking up in the spring, the cornstalks, together with the droppings of the stock, are turned under the soil, and decomposing there, afford a most valuable manure to the growing crop. Now, Mr. Editor, will not "D." consent that this is a system which "manufactures our manure on the very spots where we want it to be spread," and which obviates the "horrible drudgery of hauling out and spreading manure on exhausted fields? It will be seen that this system manures the land at no expense whatever; while other systems are not only very expensive, but "tedious and horrible drudgery," The only *labor* devoted at all to manuring in this system is, that of hauling out the corn to the stock and spreading it over the feeding ground; but this labor accomplishes also the important and indispensable duty of feeding the stock; and to say the worst, it is no more, if so much, as is requisite, under other systems, to get the food of animals from the fields where it grew to the barn, whence, after passing through the animals, it is to be thrown, with painful labor, in compost heaps, and then hauled back again to the fields. I do not pretend to doubt, that barn-yard manure, *if especially taken care of and manufactured in compost heaps*, is a more valuable manure spread on the fields than the under vegetable matter which the grazing system gives to the soil. But I do insist that this system not only returns more vegetable matter to the soil than it takes from it, and that it replaces more vegetable food in the fields than any other system with which I am acquainted, through the medium either of observation or books.

It is true that manure manufactured carefully in compost heaps, where its stimulating gases are prevented from escaping, is a more effective vegetable stimulant than vegetable matters which have remained exposed and uncovered on the ground.—But the only matter of this description which, in the grazing system, is thus exposed to waste or loss of its fertilizing powers, is the corn-stalks fed from the beginning of winter till spring on one of the fields. But let us look a little into the extent of this loss and compare it with that which results from the other system. I am by no means satisfied that there is at all any loss of fertilizing power sustained by spreading the corn-stalks on the exposed surface of a field; for the gases are not evolved till the vegetable matter assumes a putrescent quality, which is rarely the case unless such matter be mixed with dung or other fermenting materials. But how stands the case in the barnyard? Even under the most careful husbandry of the manure of a barn-yard, more of its value must be lost there by the escape of its gases than can possibly occur in the grazing field. The dung of the animals lies on the ground or the barn floor till convenience or necessity requires its removal to the compost heap; and I am sure that this matter is in a far more putrescent and fermentable state than dry cornstalks can be, and that it loses more of its stimulating power than can by possibility be parted with by the cornstalks. But even granting that the loss in the two cases were equal, the great difference in the quantity of manuring material furnished the fields under the different systems would turn the scale in favor of the grazing system. Under that system, *all* that the earth yields, is returned to it without loss of quantity, and it is equally spread and diffused, and incorporated through the entire soil; under the other system, that which is grown on a field is taken off, and, if returned at all, is carried back diminished in quantity and spread unequally over the surface. I admit that barnyard compost manure is very powerful and valuable; and that it derives much of its efficacy from the animalizing process of passing through horses and cattle; but I wonder that the method of ploughing in sod which I have described, is not seen to be the most perfect plan of forming a compost heap ever invented or practised. In this plan the sod, the material of the manure, is taken in a state when no evaporative processes are wasting, in evolving gases, its most vital qualities, and it is turned under the earth where subsequent fermentation does not give its gases to the winds, but where the soil reaps the entire benefit of the decomposition of all the vegetable matter grown on it. It is true that *gardeners*, in Flanders, England, New England, and elsewhere, profitably make compost heaps from the materials in the barnyard or the stable, aided by other materials carried there, for the purpose of manuring small parcels of ground. I do this myself: and I would not be deprived of the pleasure, as well as profit, of so treating my garden, for four times the whole value of all its produce. But this is a system only suited to very small farms compared to those of this country. Here land is cheap, and plants and labor scarce and dear; but land is high and labor abundant and cheap, where these laborious plans of manuring are profitably conducted. Under our system, ten men is a force sufficient to cultivate profitably two thousand acres of land, and the products and fertility of the farm will annually increase. But I am dilating too widely on this branch of the subject.

As soon as the corn is shocked, the field is prepared for rye, which is immediately sown and harrowed in. Some, however, in the hope of getting more forward winter and spring pasture, and to let the rye get well rooted before frost heaves the ground, sow while the corn is yet standing and plough in; but by this process, the ridges, formed in cultivating the corn crop, remain unleveled, which, to say the least, is no agreeable sight to the eye of a neat husbandman. The clover, from the seed spent the second year, will come up spontaneously after the rye has been fed down; but the grazier will judge of the propriety and economy of sowing other grass-seed, to come forward with it. And so go round and round again and again with the same system of rotation; and if this system of husbandry does not yield large profits and at the same time improve the soil every year, I will never again deny the patriotism and good judgment of those native Kentuckians who remove to the west for *fresh* lands, or even of those who go to the south to establish cotton farms.

But there is another branch of the grazing system yet to be noticed. The successor to exhausted fields, will most generally have to set the woodlands, attached to the farm, in blue grass; for few of those who go to "the *new* country" for *fresh* lands, were provident enough in this *old* state, to clean up their woods and make pastures. Their stock generally subsisted "in the range." Their lean, bony, angular pointed cows were browzing the bushes with horribly toned bells depending by a strap around their necks; their sheep were at large too, headed by a "bell wether;" their hogs, if ever you could come up to them in the woods, while seeking "*mast*," on discovering you, would utter their peculiar "hugh!" and off would go like frightened deer; and ten to one, but you would see some "bag of bones," *somewhat* in the shape of an old mare, tinkling too her drowsy bell, at the head of three or four ragged "young things," commonly called colts and yearlings, biting off the buds of the undergrowth. And did you never observe, Mr. Editor, that this class of—not good farmers, for I can't call them so, but—vexers of a kind soil, are the very men who rail out so against our paying a little extra to get superior breeds of stock? But there are few, if any of this class, remaining in the improved districts. Some are reposing beneath the clods which they vex no more; many more have taken large bodies of land and the fever and ague in the west, and the few who are still left, have *partially* set their lands in grass, ☞ *because the new-fangled notions of farming have destroyed all the range!*

But I am off the track again. The preparation necessary for covering woodland with a close turf of blue grass is, to cut out all the undergrowth and trees of every kind, not wanted for fencing, fuel or other economical uses. The leaves are raked up and burnt with the useless wood, and then, in the latter end of winter or very early in spring, the land is seeded with blue grass. It is a very delicate plant when it first springs, and should not be grazed for a year, unless very vigorous, and not then till the seeds have matured. We thus have a most luxuriant coat of blue grass and it is there for ever without further trouble. There is no attention necessary to its preservation other than the exercise of prudent care against overstocking it and against turning on it early in the spring before it gets a good start. I do not know any country on the globe in which, in an agricultural point of view, the woodlands are so valuable as in Kentucky, and certainly no rural sight can be so lovely as that of a woodland blue grass pasture, where all the unsightly and useless trees are removed and the soil is coated with a fine close turf. It is true that woodland grass is not equal, in nutritious quality, to that growing in open fields; but still it is a powerful auxiliary to the resources of the grazier. I have known woodland grass rented for three to five dollars an acre from May to December, and this is more net profit than was probably realized from cleared land by many of those whose system impoverished themselves and their fields. But let the intrinsic value of woodland grass be more or less, it is so much *clear gain* over any other system of husbandry.

Nor is it the only valuable quality of blue grass that it grows more luxuriantly in woodland than any other grass. Its superiority, as a rich and permanent grazing grass in the open fields, is equally manifest, though the value of other grass is highly appreciated. Clover, though very luxuriant, is valuable as a grazing grass, but, comparatively, a short time. Salted, it makes, with careful attention in harvesting, and if not injured by rains while cutting, a good hay; but probably its greatest value lies in its effect of improving the soil by means of its wonderful system of foliage, stem and root.—Timothy is both valuable as a grazing grass, and the best of our hay grasses. Cattle are very fond of it when young and tender, but do not relish it after. Herds grass or red top is the best for low, moist or wet land, but there is little of this description of land in the calcareous districts. It makes a beautiful hay; but, I believe, like timothy, is not a good grazing grass when a little old. Orchard grass is very early in its appearance in the spring—grows more rapidly than any other grass, and of course recovers sooner after grazing. But a serious objection to it is, that it grows in tussocks. that is, detached bunches, and the intervals are never well filled up with any perennial grass so as to form a close covering, like blue grass, of the entire soil. It is a very valuable grass, like timothy, mixed with clover to prevent hoove. Blue grass, though not quite so forward in the spring as other grasses, is on the whole, according to the judgment of most of the graziers, far the most valuable for grazing. It is luxuriant, nutritious and durable; it is a perennial, and will ultimately root out every other grass, even the native white clover; it grows more and more nutritious with advancing age; and no other can come in comparison with it as winter grass. It not only grows in the warm spells of winter, but if the second growth of summer be reserved for winter grazing, it is a most excellent and grateful pasture to animals throughout the whole of that drear period. An old patriarch grazier told me, a year ago, that he had a number of brood mares, ten or twelve years old, that had never eaten a mouthful of grain in their lives; subsisting wholly upon blue grass, except when the ground was covered by deep snow, when hay was given them, and he thought even this was not absolutely necessary. His mares were large, and always fat. Another distinguished grazier, owning some 2,500 acres, told me, a few weeks ago, that he intended, when he grew old and the labor of superintending his farm became burdensome, to culti-

vate no other *crop* than blue grass, except barely enough grain to feed his family and work horses. He had no doubt he could raise large fat beeves on blue grass.

In maintaining that the grazing system is a most admirable one, both in view of large annual profits and improvement of the soil, while it is exactly suited to our peculiar circumstances, in reference to climate, markets, and particularly the character and amount of our labor, yet there is one tendency in it, which as a political economist, I cannot but deplore, and that is to enlarge exorbitantly the size of farms, and decrease the number of the tenantry. It certainly thins population, while its operations provide the means of sustaining an increased population. A grazier of good judgment and active energy is sure to buy out all his surrounding neighbors who do not practise the same system of husbandry. Even the stiff, full handed hemp raisers have been known to yield their lands to the graziers. Small farms, cultivated by industrious and intelligent owners, certainly would contribute more to the prosperity and strength of the state. But why need we indulge speculations on this subject. The pride of acres, the thirst of accumulation, the desire of extended possession, are passions of the human breast, which no *postulate* in political economy can curb or restrain; and it is more than idle to speculate upon evils which we cannot remedy. I do not ever fear oppression, in this country, from the over-riding power of a landed aristocracy. Laws of primogeniture and entail can never harm us here; and though a few strong-minded, industrious, energetic farmers do accumulate possessions, almost equal to dukedoms in other countries, the division of their lands among their heirs, soon cuts them up again into small farms of convenient and manageable size. But I am prone to wonder and enlarge, and have already extended this communication to too great length.

I presume "D." will not expect me to explain particularly why the manuring of the grazing system is so peculiarly effective in "our *calcareous* soils." He is, no doubt, apprised that of all descriptions of soil, the calcareous are the most productive; and especially the best adapted to the growth of the grazing grasses. *Rich* silicious soils produce heavy crops, both of corn and grass, but they are still better adapted, if they have only a very small portion of calcareous matter, to the growth of wheat, barley, oats, and especially, roots. But they can never come into competition with calcareous soils as grazing lands.

It would be extremely useful, Mr. Editor, not only to "many subscribers" in Tennessee, but in Kentucky and other states, if you would procure from a number of our successful graziers, essays embracing the details of the grazing system.—They would embrace too much labor for any one writer, other than a professional author; and I hope the calls from their brethren in Tennessee and elsewhere, will induce them to come out in your paper and state their practices. Let one state his method of setting woodland and open fields in grass—another his mode and time of grazing, stating the value of the various grasses—another his winter treatment, the quantity of fodder given his young stock and the amount of corn fed to the old—and so on, till all the details are fully stated. In proposing this, however, no one should be restricted writing as fully as he chooses on various branches of details; for though some excel in particular branches, one in making grass, another in producing corn, a third in the economy of feeding, a fourth in his judgment in breeding, and so on, yet many unite eminent knowledge and judgment on various branches of the great subject. Why are not the pens of the Cunninghams, the Humes, the Clays, the Warfields, the Martins, the Boggs, the Suttons, the Dedmans, the Shelbys, and the hundreds of others, whom you and I might name, busy writing for the instruction of those who are imploring information on the various branches of agriculture in which they have respectively distinguished themselves? I wish I could infuse into them some of the spirit which I know stimulates your efforts and mine, and those of a small, but noble band of brethren on this great and glorious subject—the improvement of agriculture.

In concluding this long and desultory letter, dashed off, I assure you, with great haste, under pressure of various employments, I beg leave, while offering my respects to "D." to express the hope that the general outline of our improving system is rendered intelligible to him and his neighbors; and I shall rejoice to hear that he is so impressed with its advantages, as to come and witness it, and study it, and then put it in operation in Tennessee, and thus induce his neighbors to follow his example; for I have long believed and often said, that the grazing business would enrich the pockets and the fields of that noble state faster than tobacco or cotton. Very truly, yours,

THO. B. STEVENSON.

THE TIMES [IN SOUTH CAROLINA.]

From the Carolina Planter.

The financial affairs of the country, public and private, are in a "mixed up state." The currency is as various as the advocates of all kinds can desire. Specie, government post notes, paper of suspended banks, shinplasters, and script, inconvertible paper medium, bearing interest—all are afloat, and all passing current.

The agricultural affairs of the country are in a "desperate" state. Last year more cotton was made than has ever been before in one season—prices are flat—and what is the consequence? more cotton is planted this year to make up in quantity the fall in price—and it will fall lower, if the season continues, as it has begun, favorable. The corn crops are likely to be destroyed by chinch bugs.

In some parts of our state great sickness is prevailing among negroes. Bilious and typhoid pneumonia, diarrhea and dysentery have been frequent lately. Horses throughout the whole southern country are diseased—and dying from the epidemic catarrh. Cattle are in worse condition this spring than for several seasons, and are dying of *hollow horn*—owing to scanty subsistence during the winter, which followed so dry a summer as the last—hogs generally have the mange—cut worms are destroying our gardens—curculios and other insects have attacked our fruit and trees. With all our internal commotions, there are rumors of war—and some of our members of congress are so keen to begin that they have actually "come to the scratch" in the very halls of legisla-

tion—and we the sovereign people are paying thousands per diem to inquire into the facts of a case, which is a stain upon our national council. O tempora, O mores!

FORCE OF INSTINCT.

Mr. Southey, in his History of Brazil, thus describes the perilous situation of Cabeza de Vaca, who, sailing towards Brazil, is preserved from shipwreck by a grillo or ground cricket:—"When they had crossed the line, the state of the water was inquired into; and it was found that of a hundred casks there remained but three to supply four hundred men and thirty horses: upon this the Adelantado gave orders to make the nearest land. Three days they stood towards it. A soldier who set out in ill health, had brought a grillo, or ground cricket, with him from Cadiz, thinking to be amused by the insect's voice; but it had been silent the whole way, to his no little disappointment. Now on the fourth morning the grillo began to ring its shrill rattle, scenting, as was immediately supposed, the land. Such was the miserable watch which had been kept, that upon looking out at this warning, they perceived high rocks within bow-shot: against which, had it not been for the insect, they must inevitably have been lost. They had just time to drop anchor. From hence they coasted along, the grillo singing every night as if it had been on shore, till they reached the islands of S. Catalina."

SQUASHES.

From the Maine Cultivator.

If you would raise squashes for winter use, mark out on the surface of the land six or eight spots for hills, eight feet apart each way. Then take a spade or shovel and dig out a circle, say three feet in diameter, throwing the earth out six inches deep.—Into each hole empty a wheelbarrow load of old rotten manure, mixed with ashes,—and if there is a little lime in it, so much the better. On to this draw the loose earth back which you throwed out of the hole. Now take your spade and dig and mix the soil and earth well together, taking care to pulverize the whole mass faithfully. Level the top off and sprinkle half an inch of rich loam over the top. Drop a dozen seeds on the hill, and press them an inch beneath the surface with the finger. With a hoe smooth and press the top down. If you have a box fitted to receive two or four panes of glass, put this on the hill—or rather if you have such a thing, place it on the hill before you plant the seeds, and drop them all within the frame. Ultimately leave not more than two plants in the hill to stand. You will find that these will, in due time, run out and cover the land all over, and produce you more, larger and better fruit, than if you had the hills nearer together, or allowed a greater number of plants in the hill. It is well, however, to plant enough in the first instance, as a contribution to worms and bugs. If you save two healthy plants out of the dozen that came up, you will do well, and these will be enough. The roots of squashes, under ground, will extend as far and occupy as much space, where the soil is free and loose, as the vines will cover above ground.

DIFFERENT SOILS.

From the New Genesee Farmer.

Last month we spoke of the importance of a *fine soil*, of *shade*, and of a regular supply of *moisture* for delicate seeds; but another view of the subject may be taken. Among the myriads of plants that embellish our globe, varying in form, in substance, and in color, great constitutional differences exist. Some, like the sea-weed, only vegetate in brine; others, like the wild rice of the west, flourish most in fresh water.—The truffle always remains under ground, while the mistletoe only germinates aloft on trees, and seems to feed on air.

But between the thousands that spread their roots through the earth, and their leaves to the light, depending on timely showers for their nourishment, great differences exist in regard to *soil*. The yellow bloom of the *hypoxis*, is only seen on close *clays;* the perennial *lupin* confines itself to beds of *sand;* and the locality of the *talinum* in Pennsylvania is on naked *magnesian* rocks. *Lime* is essential to the chief objects of the farmer's culture; and a species of *veronica* from its attachment to this mineral, is called in Virginia, the "marl indicator."

Besides the *mineral* constituents, however, there are *vegetable* principles derived from the decay of particular plants, which become a part of the soil, and give it a peculiar character. We may separate the *sand* from the *clay*, and both from the *lime* and *magnesia* or iron—weigh the vegetable matter, and then attempt to make a similar soil of new material in the proper proportion; but unless we have the recrements of similar plants, it cannot successfully be done.—We have seen no artificial soil that would suit the rose-flowering locust; and the heaths only grow in peaty earth, or something analogous. The decaying leaves of the sour pine, so pernicious to the cereal grasses, is a rich manure for the red sorrel.

Among the great numbers of ornamental plants which are collected from so many points of the earth's surface, it is not reasonable to expect that land of the same quality can accommodate them *in the best manner*. Some will flourish in their new abode; others will vegetate for a time, while a third class will speedily dwindle and perish. Various soils, therefore, differing in both their *mineral* and *vegetable* composition, are necessary in extensive gardens. Small spots of two or three feet diameter, in many cases will be sufficient. Some *annual* flowers will doubtless require them as well as shrubs and herbaceous perennials; and the greater the variety of soils, the greater will be the chance of success. On a small bed of sand, carried more than twenty miles, we have *pinus rigida* and *magnolia glauca*, growing in luxuriance; though every attempt to cultivate them in our common soil had failed. Many beautiful plants require peat from the marshes; and a small cask of the right soil would impart health and vigor to the kalmias and rhododendrons.

BLUE MARL AND GREEN SAND.

To the Editor of the Farmers' Register.

Stafford county, Va., May 20, 1840.

In a communication from a Maryland correspondent, (Farmers' Register, Vol. vii, p. 105,) I find the following statement:

"In communications heretofore made to the Register, I have suggested that *blue* marl contains properties fertilizing beyond the lime contained in it. Farther observation has confirmed the opinion," &c. On the farm of the Potomac Silk Company there are very extensive deposites of *blue* marl, which I have been using on a small scale for nearly four years. In some of these banks there is an abundance of decomposed shells, but in others no shells appear, but apparently are made up entirely of the blue *sand*, or rather clay, (for there is no sand in it.) Now the action of both of these marls is precisely similar, as is proved from the following experiments:

In 1837 I manured beets in the drill with the marl having shells, and also in adjacent rows with the green sand or the marl without shells. There was manifest improvement in the growth of the beets, compared with some in similar soil, not marled, but the effects of both of these marls were identical. Before applying the marl the soil was thickly set with sorrel, but that has subsequently disappeared as far as the marl and green sand extended.

Both the shell marl and the green sand have been applied to poor soils, on the surface, and the land left for eighteen months without cultivation; and in every instance, even on broom straw soils, a growth of *white* clover follows. So striking is this effect that the carts may be tracked for nearly a half mile by the growth of the *white* clover.

I have but little experience in agricultural pursuits, but I am disposed to communicate freely the results of my experiments; and I now ask the favor of you, or any of your correspondents, to answer the following question:

Does a top-dressing of lime, without cultivating the land, invariably produce a growth of *white* clover?*

I have applied marl to twelve acres, using from 350 to 400 bushels to the acre.

LAYTON Y. ATKINS.

P. S. This is a rainy day, but some silk-worms are spinning, and those in the rear are very thrifty.

I have morus multicaulis cuttings growing in a *pure* bank of *blue* marl, and the leaves are of a deeper green than those growing out in the fields.

* We cannot answer this question from our own experience.—ED. F. R.

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